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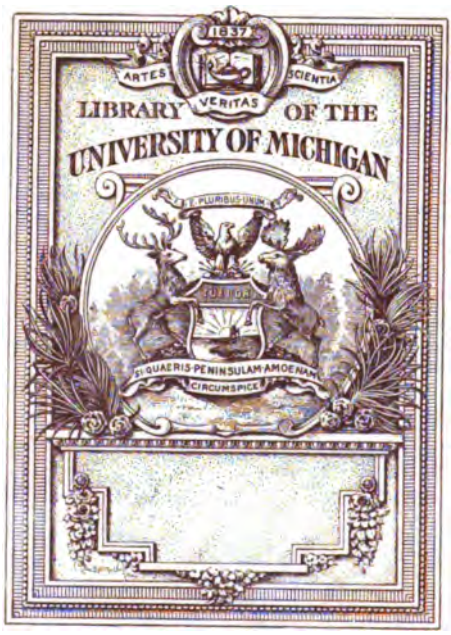

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MEDICAL LIBRARY AND HISTORICAL JOURNAL

EDITED BY

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MEDICAL LIBRARY AND HISTORICAL JOURNAL

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THE GRADUATION CEREMONY WITH AN ACCOUNT OF SOME MODERN SURGICAL CELEBRATIONS. *

By W. W. KEEN, M.D., LL.D.,

Professor of Surgery, Jefferson Medical College, Philadelphia, Pa.

HAVING been present within the last five years at several rather unusual surgical functions, it has occurred to me that it might be of interest to the members of the Keen Society to learn something about the graduation ceremonies and other similar special functions at other institutions than our own, and not only in our own time, but in the more formal and ceremonial middle ages.

My principal source of information as to the latter is an admirable address delivered to the graduates in medicine of the University of Edinburgh in July, 1904, by Prof. D. J. Cunningham, the distinguished Professor of Anatomy in that University. It is called "The Evolution of the Graduation Ceremony" and is a mine of information in reference to this subject. It deals not only with the ancient medical customs, but with the graduation ceremonies as observed at present in the chief European Universities.

In the middle ages there were many thousands of students in some of the most distinguished Universities. For example, Bologna, (which in 1888 celebrated the 800th anniversary of its founding,) in the 14th century, had as many as 13,000 students, and Paris at one time had as many as 30,000.

Very few of the students, however, took the degree of doctor, either in law (which was divided into civil law and canon law), medicine or theology. None of our other modern degrees existed. Every graduate was a "Doctor," *i.e.*, an educated or learned man, in one of these three faculties. The few that did take the degree,

*Address delivered before the W. W. Keen Surgical Society of the Jefferson Medical College, Dec. 11, 1905. Published by arrangement, synchronously, in the *Jeffersonian*.

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expected to enter faculties as teachers. Hence, there being so few, of course the ceremony was one of much greater individual importance and was carried out with all the formality and symbolism which commended themselves peculiarly to the scholastic medieval mind.

The candidate or graduand was presented for the degree by one of the faculty, usually the Dean, who was and is still called the "Promoter." He stands technically in the position of a Godfather or sponsor for the person upon whom the degree is to be conferred. Even to-day, at the graduation ceremony of the University of Dublin, the Promoter says, " I present to you these my *sons,* etc."

I cannot, perhaps, better indicate the importance of such an occasion than by quoting a paragraph from Prof. Cunningham's address: "A love of pomp and pageantry was a leading characteristic of the medieval mind, and the graduation ceremony afforded the most abundant opportunity and the most ample scope for the indulgence of this propensity. For several days before the celebration elaborate preparations were made. Attended by the University Bedells [beadles], with their insignia and maces, and often also accompanied by trumpeters and pipers, the candidates, mounted on horseback, paraded the streets and gave formal invitations to their friends and to all notables of the district to attend the ceremony. At last the eventful day arrived and the whole town was in a state of expectancy. It was a holiday: the shops and booths were shut, the artisans had stopped work and the streets were thronged with people eager to witness the procession. This, as a rule, started from the house of the candidate, but in certain cases it was formed at the school buildings. Preceded by the mace-bearers, the Bedells, the trumpeters, and the players on the fife, the graduand, mounted on a richly caparisoned horse, was conducted to the Cathedral. The entire University, teachers and scholars, in their appropriate robes, followed in the wake of the candidate, and as the procession moved through the town, the air was filled with the din of music and trumpets, mixed with the harsher sounds of clanging bells."

Even in my own day, when I was graduated from Brown University in 1859, Commencement Day, though then already fading in importance in our busy hustling age, still convulsed the State of Rhode Island—not a very big one it is true—to some extent to its very borders. Business was largely suspended

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and the day was a holiday in Providence: the sheriff of the county then, as now, preceded the president and other dignitaries of the University in entering the church, carrying his official sword, which I suppose represents the mace, as one sees it in such ceremonies abroad.

We have also a description of such a pageant from the pen of John Locke, the celebrated philosopher who also studied medicine. In Dr. John Brown's essay on "Locke and Sydenham," he quotes an account of the ceremony at Montpellier, France,* as described by Locke: In 1675 Locke went abroad for his health, and remained some time at Montpellier. He kept a diary, and large extracts are given by Lord King. The following is his account of the annual capping at Montpellier: "The manner of making a Doctor of Physic is this: First a procession in scarlet robes and black caps—the Professor took his seat—and after a company of fiddlers had played a certain time, he made them a sign to hold, that *he* might have an opportunity to entertain the company, which he did in a speech against innovations—the musicians then had their turn. The inceptor or candidate then began his speech, wherein I found little edification, being chiefly complimentary to the chancellor and the professors who were present. The doctor then put on his head the cap that had marched on the Bedell's staff, the sign of his doctorship, put a ring on his finger, girt him about the loins with a gold chain—made him sit down beside him—that having taken pains he might now take his ease, and kissed and embraced him in token of the friendship which *ought* to be amongst them."

The ceremony was usually held in the Cathedral, which, as you know, is so named from the "cathedra" or chair of the Bishop. Westminster Abbey has no Bishop's throne or chair because it is not a Cathedral in the legal sense, but is an abbey church. The Dean of Westminster, who is, of course, the head of the ecclesiastical corporation, is not responsible to the Bishop of London or any other Bishop, but he is directly under the jurisdiction of the Archbishop of Canterbury. Where no Cathedral was available, the degrees were conferred as a rule in the principal church of the city. Now, however, even in Europe they are

*"Montpellier," says Gosse, in his life of Sir Thomas Browne, who was also a student there in 1630, "was almost indispensable in those days to foreign students who could get no training like it anywhere else in Europe."

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very frequently conferred in an academic rather than an ecclesiastical building.

The various symbols connected with the graduation in medieval times were as follows. You will see in our modern "commencements," there is left but little of the former gorgeous pageantry.

First, the graduand sat on a *seat below the Faculty* just as you do in the Academy of Music, but on receiving the degree which conferred upon him the rights of a teacher, he assumed a chair on the platform.

Second, an *open book* was handed to the graduand to remind him that his studies must be continued.

Third, a *closed book* was also given him in order that he might understand that wisdom was not to be gained from books alone, and that he must not be bound absolutely by the authority of his predecessors, wise as they may have been.

Fourth, a *cap* was put on his head, and in the Scotch Universities, this cap is still used, as I shall describe later. Hence where the cap is used the graduation is not called the conferring of diplomas, or as we call it "Commencement," but is called "Capping." The students of theology were given a black cap, those of law a red hat, those of medicine, caps of different colors, violet and blue being the commonest.

Fifth, a *ring* was placed upon his left ring finger to indicate he was wedded to science. It also had another significance; namely,—that there was a sort of academic knighthood conferred by the degree.

Sixth, a *kiss,* the "osculum pacis," usually upon both cheeks, was given by the authority conferring the degree. If in these days of women graduates we had co-education at the Jefferson and the kiss of peace still held its place in the graduating ceremony, I tremble to think of the emotions of our honored President, or the Dean.

In some Universities there were additional symbols connected with the graduating ceremony, which were not, however, by any means universal. In Spain the graduate was invested with a sword, girdle and spurs of gold. In certain Universities there are traditions that he had to keep a vigil the night before the ceremony, and in Vienna it is stated that, as is the case with a candidate for knighthood, he had to undergo on the previous evening the "ordeal of a bath." It is a little odd to hear this grateful daily

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boon called an "ordeal." But I fear that many medieval knights had but a slender acquaintance with the virtues of water either internally or externally.

In addition to this the torch-light procession which not uncommonly terminated the festivities was originally symbolical, the lighted torch standing for the torch of learning.

Of course such an elaborate graduation ceremony entailed a large expense which had to be borne by the candidate for the degree of Doctor. In addition to this he was expected to give hats, caps, robes, clothing, and even confectionery to not a few of the persons who took part in the ceremony. Some rather curious details in relation to these gifts are to be found in Prof. Cunningham's address. This expense reminds one of the fact that Lord Roberts, when recently offered the Garter by King Edward, declined the honor because the fees amounted to over $5000, a sum which his modest means did not permit him to expend.

The whole ceremony, of course, terminated with a banquet, at which there was not only a lot of eating, but much more drinking than was desirable, much singing and jesting. In fact hilarity went so far in some Universities that statutes were drawn up forbidding the presence of trumpeters, actors, and jesters. Sometimes the students who were not invited as guests gathered around the door of the building and amused themselves by snatching the food and wine from the servants as they were carrying them into the hall. In Spain and Portugal the unfortunate graduate had to provide a bull-fight for the amusement of the University. At Paris, Oxford, and Cambridge, the papal authority was invoked to prevent an expense exceeding what would be equivalent to about $2,500 at the present day.

Little by little all this pomp and display has lessened until to-day only a remnant of it is left. In fact in some Universities, as, for example, at Strasburg and Munich, as soon as the student has passed his examination, he goes home and his diploma is sent to him, so that there is no ceremony whatever. So, too, with the examination of the Royal College of Surgeons of England, there is no graduation ceremony, but the diploma is sent to the successful candidate.

In a few of the European Universities, somewhat of the ancient ritual has been retained. In the University of Rome, the ring, the hood, the chain, and the kiss are all employed at the present time, but Prof. Durante, who received a degree in

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Edinburgh, came without any academic gown, because, as he informed me, the University of Rome had no official robe.

In Prague a chain is thrown around the neck, a ring placed on the finger, and a book presented. Each of these acts is announced by a blast of trumpets. At the Swedish University of Upsala the ceremony begins with a salvo of artillery, and the whole is attended throughout with fanfares of trumpets and the din of cannon. Not only are there the cannon and the trumpeters, but the Doctor of Philosophy is crowned with a laurel wreath, usually made by his friends, fiancée or his nearest young lady relation, not, you observe, his "best girl." The doctors of law and medicine are capped with a black silk hat having a golden buckle. In Louvain, Belgium, besides the procession, the candidate is capped, ringed, and placed in a magisterial chair.

Dr. M. B. Tinker, a graduate of the Jefferson who also took his degree at the University of Berlin, has kindly given me the details of the ceremony in that University as follows: "Only one man passes through the ceremony at a time although sometimes there are three or more men who come before the Dean on one day. The candidate with several of his friends, in full evening dress including white tie and white kid gloves, is seated at one side of the great University aula. The Dean of the Faculty with his flowing crimson academic gown of silk and velvet comes in at the great doors and seats himself on the opposite side of the room, just below the platform and stand which is used by the orators and University authorities on state occasions. The fact that the candidate is in waiting is announced to the Dean and he rises, bows, and states that he is ready to receive any communication from him. The candidate then states in a regular form that is used on such occasions that he has successfully passed the *tentamen* and *rigorosum* examinations and that he is now prepared to present his dissertation for discussion and to defend it, if necessary, before all comers. [You see how valiant a knight he is!] He further asks the privilege of presenting his theses and defending them in the German language. All conversation between the Dean and the candidate up to this stage is carried on in Latin. I need hardly say, I am sure, that most candidates write out their little speech and have it corrected by some of the University instructors in Latin and then commit it to memory. The Dean then rises, bows and grants permission for the candidate to defend certain theses with regard to his dissertation or

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other medical subjects in German language. He ascends to the platform just below his desk. The candidate states his main contentions and inquires if any one present wishes to take exception to his position. Usually there are at least three opponents, who rise one after the other, and beg leave to dispute with the candidate. The candidate answers their arguments as best he can. The opponents usually express their approval of the arguments offered by the candidate in reply to what they have said and the Dean adds a word or two of criticism or commendation. He then uses the following Promotion Formula: 'Candidate, most distinguished! most worthy! After successfully passing a rigorous examination, you have petitioned the Faculty of Medicine that the highest honors in medicine be conferred upon you. Your Dissertation and Theses having been by you learnedly defended against the arguments of opponents, there remains no impediment to your obtaining the degree of Doctor of Medicine. Before, however, this can be conferred upon you, you must bind yourself by an oath in the words of which you will now most straitly swear.'

(The Doctor at this stage pronounces the following oath):—

" I promise and swear that I shall not practice the art of healing for my own good, but in order to show forth the glory of God, to protect the health of men, and, as far as lies in my power, to increase knowledge; that I shall carry out the work of a physician with the greatest faith and duty, and, as long as I have the power, with care and prudence; that I shall come to the assistance of anyone in labor without distinction or preference, with no ambition, but with equal attention to rich and poor; that I shall endanger the life of no man by rash experiment; that I shall never turn the practice of Medicine away to vain or ignoble ends, but shall persevere with unremitting study to fathom and learn the Art; that I shall treat my brethren of the Art kindly, amicably, and as the dignity of the Art demands; that I shall associate myself, with most ready spirit and with no regard for my own ends, with what ability I can with their labors for the health of the sick, and in everything shall take pains to raise the Art, which I profess, to the sanctity of a religion. Ita me Deus adjuvet et sacro-sanctum ejus Evangelium.'

Then the Dean proceeds:

'Which matter be blessed and fortunate, and may Almighty

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God ordain it to be for the good of your country. By the authority and under the auspices of Wilhelm II., Emperor of Germany, King of the Prussians, most powerful, most just, most gracious, and by the Decree of the Medical Faculty, I, * * *, Doctor of Medicine, Public ordinary Professor, presently Dean of the Medical Faculty and Promoter lawfully appointed, create you, * * * , Doctor of Medicine, declare you so created, and proclaim you as so declared. Having fulfilled the requirements which were to be fulfilled, ascend to the higher seat of the Doctors.'

(The young Doctor proceeds from the lower seats to the higher and the Dean gives him the diploma with the following words:)

'Hail! most learned sir! most worthy Doctor! I congratulate you on the honours conferred upon you! I hand you your diploma, sealed with the seal of the Medical Faculty. May you carry on worthily and successfully continue the profession you have now begun. Farewell!'*

There is then a great deal of hand-shaking and congratulations from fellow students and friends and the ceremony is completed except that the successful man usually takes his friends out to a restaurant for a banquet.

I think the University of Berlin adheres more strictly to the old-time manner of conferring its degrees than any of the other Universities. In hardly any other University is it required that the candidate shall use the Latin language. Formerly it was required that he should write his dissertation and defend it in Latin. The defense of the dissertation is now a matter of form in most cases, even in Berlin. Notices are posted several days before the exercises are to take place so that if any one cares to enter the debate he has an opportunity to do so. As a rule the candidate meets his so-called opponents the night before at some concert garden and enjoys a very pleasant social evening with them. They tell him what criticism they will offer and it is arranged just what reply he shall make to each and all of these criticisms. Altogether it is a rather pleasant affair."

Only at the Universities of Spain and at Coimbra, in Portugal, does the medieval ceremony survive to its fullest extent.

*These formulæ used by the Dean and the oath taken by the candidate are interpolated from the address of Professor Cunningham, into Dr. Tinker's account.

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I have had the pleasure of witnessing three ceremonies which were somewhat analogous to those of graduation. These took place at the Royal College of Surgeons of England, the Royal College of Surgeons of Edinburgh, and the University of Edinburgh. A short account of each may be of interest to you.

The Royal College of Surgeons of England was founded in 1540 by Henry VIII. By a legal technicality they lost their charter in 1799 and a new charter was conferred upon them by George III. in the year 1800. In the year 1900 they celebrated the first centenary of the new charter by a very elaborate ceremony in Burlington House, Piccadilly, London. You will find in our library two photographs, one representing the ceremony when the degrees were conferred, the other the dinner in the evening. The Prince of Wales, now King Edward VII., was made the first Honorary Fellow in private at Marlborough House. Two days later, on July 26th, Lord Salisbury, the leader of the Conservative Party, and Lord Rosebery, the leader of the Liberal Party, and thirty-two surgeons from various countries in the world were made Honorary Fellows. Not more than four were selected from any one country.

This function was one of the most brilliant that I have ever seen on any academic occasion. The only ones that would compare with it were the recent ones in Edinburgh, which I shall describe in a moment. A procession was formed, the mace bearer leading the way and followed by the officers of the College, the candidates for the Honorary Fellowship, and the Fellows. The President of the College, Sir William MacCormac, in his red robe of office, occupied the centre of the stage. On his right and left were the first and second Vice-Presidents of the College, next, on the right, was the Marquis of Salisbury in his robes as Chancellor of the University of Oxford, a robe of heavy black silk elaborately embroidered in gold, and on the left the Earl of Rosebery in his scarlet gown as Doctor of Laws of the University of Edinburgh. All of the thirty-two professional candidates for the honor were grouped in two rows of chairs in a semicircle in front of the President. Nearly all were in academic or military costume; the Spaniards wore capes of bright yellow, the French coats embroidered with green vines and leaves. Of the candidates from other countries some were in uniform and others in the various University gowns of their several countries. A very small number were in full evening dress. The audience was equally bril-

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liant, nearly all present wore academic robes of all colors and especially all varieties of hoods, representing different Faculties and different degrees, while the uniforms of the Army and Navy and the bright summer dresses of a large number of ladies completed a spectacle which was worth travelling a long distance to see.

As his name was called each candidate stepped up in front of the President, was presented with a diploma, bowed and resumed his seat. No robe was put on him at the ceremony. He provided himself with one later if he desired it. The robe is of black alpaca faced with crimson, but has no hood. A few addresses were made by one representative of each of the principal countries from which the Honorary Fellows came. The ceremony was concluded by an historical address by the President. In the evening an elaborate dinner was held at Lincoln's Inn, one of the stateliest halls of the Lawyers of London. At the dinner, after-dinner speeches were made by the Prince of Wales, Lord Salisbury, Lord Rosebery, the Lord High Chancellor, and other distinguished guests. *

The Royal College of Surgeons of Edinburgh is the oldest surgical body in the world not connected with a University. It was founded in 1505, antedating both the Royal College of Surgeons and the Royal College of Physicians of England. On July 20th, 1905, they celebrated their 400th anniversary by conferring a number of Honorary Fellowships upon surgeons from different parts of the world. The description of the procession with the mace bearer, the President of the Royal College of Surgeons, Sir Patrick Heron Watson, the gorgeous robes, the uniforms, and the ladies present would be practically a duplicate of the preceding description of the similar functions in London five years before.

The ceremony was held in McEwen Hall. The Honorary Fellows were seated in a row in front of the platform, each wearing the dark blue robe of the College with light blue facing and white silk "frogs," but without any hood. The Promoter, Sir Halliday Croom, made a brief address in presenting each candidate for the degree. The candidate then advanced to the platform, was taken by the hand by the President, was presented

*For a full account of the addresses, etc., see the *Lancet*, 1900, Vol. II, pp. 281 and 339.

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with the diploma of the College, and the hood was thrown over his shoulders, after which he signed in the Sederunt Book the following oath:

"I hereby promise faithfully to maintain and defend all the rights, liberties, and privileges of the Royal College of Surgeons of Edinburgh, and to promote the interests thereof to the utmost of my power. I also promise faithfully to obey all the laws of the said Royal College, made and to be made."

As soon as all the degrees had been conferred, a large number of congratulatory addresses from various Universities and learned Societies were presented, beautifully engrossed on parchment and enclosed in handsome cases. After this each of the Honorary Graduates spoke for two or three minutes only in returning thanks. In the evening a festival dinner was held, at which addresses were made by M. Paul Cambon, the French Ambassador to Great Britain, Prof. Halsted of Johns Hopkins, Sir William Turner, the Principal of the University, and a few other distinguished guests. *

Two days later occurred a special ceremonial of the University of Edinburgh for conferring Honorary Degrees.

Scotland has four Universities; the oldest is the University of St. Andrews, founded in 1411. Geographically it lies a little to the north and east of Edinburgh. The next in order of time is the University of Glasgow, founded in 1451; the third the University of Aberdeen, founded in 1494, and the fourth the University of Edinburgh, founded in 1582. The Medical Department of the University of Edinburgh was established in 1685.

It has been one of the most distinguished seats of learning in Great Britain. Among the names which have made it illustrious I can only mention the following: Sir Walter Scott, Dugald Stuart, Carlyle, Sir William Hamilton, Darwin, Cullen, Sir James Y. Simpson, Syme, and Lord Lister. What an illustrious galaxy! How it excites our admiration and our envy! In one respect the University and one family occupy a unique relation. "In 1720, more than half a century before our Revolution, Alexander Monro, *primus,* was elected Professor of Anatomy at the enormous salary of £15 per annum. From this time until 1859, the year that I graduated from Brown University, when Monro, *tertius,*

*For a full account of the proceedings, see the *Lancet,* 1905, Vol. II, p. 307.

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died, the history of Anatomy in the University of Edinburgh and that of this astonishing family are almost identical. All of them lived to an old age, Alexander, *primus,* dying at seventy, Alexander, *secundus,* at eighty-four, and Alexander, *tertius,* at eighty-six. All were professors early in life; at twenty-three, twenty-one, and twenty-five, respectively. All of them taught for long periods: thirty-eight, fifty-four, and forty-eight years; and father, son and grandson, they held the anatomical chairs in Edinburgh from 1720 till 1846, a period of one hundred and twenty-six years!" *

The University of Edinburgh has a peculiar relation to a still older and a much younger University. The older is the Dutch University at Leyden, where Boerhaave, one of the most influential teachers of medicine during the 18th Century on the whole continent of Europe, was the reigning influence and whither Edinburgh men flocked for their medical education. The younger one is the University of Pennsylvania, and through the University of Pennsylvania, the oldest of all our American medical schools, the University of Edinburgh and especially Cullen, its foremost teacher in the latter half of the 18th Century, have influenced the development of early medical teaching, medical manners and medical habits in America to a very notable degree. The head of the University of Pennsylvania, and the head of the City of Edinburgh, are called not President or Mayor, but Provost. The title of our chair of Physiology at the Jefferson, the "Institutes of Medicine," is identical with the title of the same chair in the University of Edinburgh.

Almost all of our colonial physicians and surgeons went to Edinburgh to finish their medical education. Physick, our earliest and most distinguished surgeon; Redman, the founder of the College of Physicians of Philadelphia; Benjamin Rush, the great signer of the Declaration and probably the most influencial physician in America during the Revolutionary period, and a host of others were graduated at Edinburgh.

It was, therefore, with very unusual pleasure that I was present at this special ceremonial for the conferring of Honorary Degrees. The procession was headed by the mace bearer, followed by Sir William Turner, the distinguished anatomist, who is

*See "Addresses and Other Papers," by W. W. Keen, p. 13, "Early History of Practical Anatomy."

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the Principal of the University, in his heavy black silk robe lavishly embroidered with silver. Mr. Chiene, the well-known Professor of Surgery, told me that in conferring the degrees at the regular graduation a few days later, the Principal was compelled to lift the two pounds of silver on the right arm of his robe over 700 times, *i. e.*, he lifted in all over three-quarters of a ton! No mean feat for a man past three score and ten.

Then followed the other University officers, the candidates for the Honorary Degree of Doctor of Laws, the graduates of Edinburgh and other Universities, Army and Navy officers, etc. The robe of the University of Edinburgh is of bright scarlet broadcloth * faced with light blue silk, the hood of black silk lined with blue, and the cap is the four square velvet cap called after John Knox and not the usual "mortar board" hat. The large number of these robes with the brilliant gowns of other Universities, the Lord Provost of the City in his ermine robe and gold chain of office and other official and academic costumes again produced the same kaleidoscopic effect of color described in the former functions. The candidates for the Honorary Degrees again sat in the front seats on the floor of McEwen Hall. The Promoter, Sir Ludovic J. Grant, was most happy in his presentation of the ten candidates, beginning with the French Ambassador, M. Paul Cambon. As the name of each candidate for the degree was announced, he ascended upon the platform, was addressed in a few words by the Principal, Sir William Turner, and then bowing his head, was touched by Sir William with the velvet cap, which has done service for many years, and which with characteristic Scotch thrift, is made from an old pair of velvet breeches of George Buchanan, the celebrated Scotch Historian and Poet, who was tutor to King James I. Each candidate already had on the scarlet robe of the University and over his neck was thrown the hood pertaining to his degree. No diploma was presented with the

*I discovered in Bower's "History of the University of Edinburgh," Vol. I, p. 54, the reason why this bright color was adopted. In 1692, by an ordinance of the University, the red robe was prescribed so that thereby "vaging and vice might be discouraged." Evidently in those more turbulent days than our own, when town and gown were often arrayed against each other, a "vagabond" or "vicious" gentleman radiant in the scarlet robe of the University would be much more readily nabbed by the police than if he wore the ordinary dress of a citizen. Curiously enough I found that this origin of the red robe was practically entirely unknown among the faculty and friends of the University.

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degree. As soon as they had been conferred, Sir William Turner then called upon M. Cambon to respond for the Continental guests and upon myself to respond for the English speaking guests. *

A SKETCH OF THE LIFE OF THOMAS BOND, CLINICIAN AND SURGEON.[1]

By J. Alison Scott, M.D.,
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FOREWORD.

ABOUT a year ago I became interested in investigating the career of Dr. Thomas Bond. Because of his active interest in the founding of the Pennsylvania Hospital and in clinical teaching in that same institution I felt I should like to know something about the antecedents, the character, and the general surroundings of a man who did so much to mould the medical thought in the middle of the seventeenth century. I consulted various books that we possess in the College of Physicians, all the biographies available in our public and private libraries, and the various medical histories with which you are doubtless familiar. Few of them contain more than a brief sketch of Thomas Bond. I discovered more information concerning him in Morton's *History of the Pennsylvania Hospital* than from any other one book; this perhaps was but natural, as Bond and his associate physicians, aided and abetted by the shrewd advice of Benjamin Franklin, should certainly receive the credit for founding the Pennsylvania Hospital. I discovered, however, in the College of Physicians six volumes of a co-partnership ledger which gave me the opportunity of studying the character of Bond's daily work and his patients, and these facts further stimulated me to attempt to collect, as far as I could, enough material to round out the following sketch of his life,

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* For a full account of the ceremony, see the *Brit. Med. Jl.*, 1905, Vol. II, p. 240.

[1] Paper read before Historical Section, College of Physicians, Phila. Published by arrangement, simultaneously, in the *University of Penna. Medical Bulletin.*

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which, though it is incomplete, may contain some few facts regarding him unknown to some of you.[2]

GENEALOGY.

Thomas Bond, the son of Richard and Elizabeth (Chew) Bond, was born in Calvert County, Maryland, in 1712. His mother, whose maiden name was Elizabeth Benson, was a widow, having primarily married Benjamin Chew, who died about 1700. She married Richard Bond September 24, 1702. This much is known, that Thomas was born in 1712, and Phineas, his younger brother, in 1717; and also a third son, John, probably the eldest. Although little is known of their early education, it is probable that the brothers received the same advantages in early life. It is known that Thomas studied medicine under the preceptorship of Dr. Hamilton, a well-known Scotch physician of Calvert County. He subsequently travelled in Europe and spent considerable time in study at the Hôtel Dieu at Paris.

It is likely that Thomas Bond came to Philadelphia before 1730 and began the practice of medicine either in 1732 or 1734. He married Sarah Roberts when he was very young, perhaps only eighteen. They certainly had six children, and perhaps more. At this time it is difficult to reconcile all the dates I find in the records of Christ Church, Philadelphia, concerning the baptism of the children born to Dr. Thomas and Sarah Bond. Elizabeth, born July 26, 1730, and baptized September 18, 1745, was the eldest child. Thomas, Jr., born in January, 1737; Thomas, Jr., born in 1743 (this is probably a second son named Thomas); Sarah Rebecca, born January 14, 1744; Phoebe, born November 9, 1748; Robert (Richard?), born November 18, 1750; Venables, born February 4, 1754, and a second Venables, born January 25, 1765.

Elizabeth married Dr. John Martin on May 9, 1765. Neither he nor his wife lived many years, for I find that Elizabeth died on March 26, 1787, in the Pennsylvania Hospital; there is a note in the hospital minutes: "That in consideration of the eminent services rendered to the institution by the late Dr. Bond, it is unanimously agreed that no charge should be made for the

[2] For many valuable suggestions in securing some of the following information I am much indebted to Miss May Atherton Leach, of the Historical Society of Philadelphia.

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board of his daughter, Elizabeth Martin, deceased, or for the servant who attended her."

Thomas, Jr., the oldest son, married Anne, daughter of Evan Morgan, on May 10, 1764. She died April 6, 1774, a few years after losing her only son, Thomas, whose body is deposited with her in Christ Church graveyard.

Thomas Bond, Jr., took his degree of medicine and entered into practice; in the latter part of 1776 he was appointed a surgeon's mate in the medical department of the army. He seems to have conducted his affairs with ability, for he was promoted, and in 1784 was still commissioned as a purveyor or commissary; he had the rank of Acting General-Director of Hospitals. His wife had died before the Revolution (1774), and after he finished his military duties he removed from Philadelphia to Morgantown, W. Va. He died at that place December 17, 1793, was there buried, and only some few years ago were his bones disinterred and brought to this city and placed in Christ Church burial-ground.

Sarah (Rebecca) married Thomas Lawrence in 1768.

Phoebe probably died in infancy.

Robert may have also been named Richard, for in Graydon's *Memoirs* (p. 81) I have discovered the following reference: Graydon says he had become intimate with the second son of Dr. Thomas Bond, who lived next door to him. Young Richard had prematurely given up his studies at Princeton College and was giving himself up to the pleasures of the fashionable world. He notes, "He had the most lordly contempt for the opinion of the world, that is, the sober world, of any young man I have known, as well as a precocity in fashionable vices equalled by few and certainly excelled by none." He was handsome in person, being of full chest and highly colored complexion. He is stated to have been a favorite with his father, and studied medicine under his guidance. He died on December 23, 1772, of pulmonary consumption.

The first Venables probably died in infancy. The second was living at the death of his father.

Phineas Bond, Thomas' younger brother, married in 1748, Williamena, the daughter of Colonel the Honorable William Moore, of Moore's Hall, Pennsylvania. (Moore's Hall is still standing and the mansion is at present the property of Mr. S. W. Pennypacker.) Six children were born to them—five

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girls and one boy. The eldest was Phineas, Jr. Of the five girls two of them only interest us—Williamena and Elizabeth. The former became, in 1779, the second wife of Brigadier-General John Cadwalader, the son of Dr. Thomas C. Cadwalader. Elizabeth, in 1792, married John Travis, Esq., of Philadelphia. One of her daughters subsequently married a Cochrane. Through these two branches of the Bonds the present descendants of the family in Philadelphia came.

HIS EARLY PRACTICE, OFFICE, ETC.

Dr. Bond began the practice of medicine in Philadelphia in 1732,[3] at the age of twenty, and soon (1737) associated with him in his work his younger brother Phineas. They soon became active in practice, and we find either one or both of the brothers usually foremost in all enterprises, either municipal or medical. In the event of epidemics and typhus, yellow fever, or ague it was usually Dr. Thomas Bond who was foremost in suggesting methods of attack and relief.

Thomas Bond, according to a *Directory* compiled from the Philadelphia newspapers of 1764-68, lived on Second street near Norris' alley. Norris' alley ran east and west one square from Front to Second street between Chestnut and Walnut streets. There is a continuation of the alley from Second street toward Third street, called Lodge's alley, and the first street north was called Gray's alley. Norris' alley is therefore the first street north of Walnut street and is now known as Sansom street.

On the southeast corner of Second and Norris' alley stood, until a quarter of a century ago, an historical house known as "The Slate-roof House." This house was built prior to 1700 by a prominent citizen named Samuel Carpenter and was the residence of William Penn during his second visit to this country. The house was the first and only in the city at that time which was roofed with slate. Penn's son John, called "the American," was born in this house, the only one of his family born in this country. Subsequently James Logan lived there, later on William Trent (founder of Trenton) purchased it, and finally it passed into the hands of Isaac Norris in 1717. From 1764 on Mrs. Graydon kept a fashionable boarding house here and entertained many celebrities. It remained a portion of the Norris

[3] I have chosen this earlier date though Norris gives 1734.

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estate until recent years. It was demolished in 1870. It is probable that Thomas Bond lived just south of this house or in the house on the opposite corner.

Second street at that time was well populated with doctors. John Morgan lived on Second street, as did also John Redman, the first President of this College, and William and James Logan, the well-known lawyers. William Shippen lived at the corner of Fourth and Prune streets.

It must be remembered that at this time Philadelphia was but a village and the streets in many places not paved until 1800. As early as 1750 Franklin was interested in schemes to pave the streets and to light them at night. When Dr. Bond was probably at the height of his reputation the population of Philadelphia was but 28,042 (1769). Ten years before this time there were but thirty-seven four-wheeled vehicles in the city, though single horse chairs were said to be numerous. There was not at this time any daily paper published, though shortly afterward, in the 70's, a daily paper began to appear. There were several papers published twice or three times a week. The annual death rate a few years after Dr. Bond's death, for instance, from September, 1787, to 1788, was but 998; this is perhaps 25 per cent. more than our weekly death rate at present.

During many years of his practice Dr. Bond went about seeing his patients in a two-wheeled sulky drawn by a black horse (Watson's *Annals*). This mode of conveyance was then permitted only to the aged and infirm doctors. Watson stated that the young physician of those days who would have been rash enough to use any mode of conveyance other than his legs would have lost both his reputation and practice in a short time. Some of the older physicians used to go about on horseback. Thus Dr. William Shippen, Sr., when a hale and hearty youth of ninety, would ride in from Germantown on horseback to see his patients in the city. It is stated that this gentleman is never known to have worn an overcoat at any time. Protection for the body in bad weather was not over-sufficient in those days. Those who had to work in the open in bad weather wore a long cape, which was lined with a sort of rubber cloth, with a hood having a projecting rim of the same material. It will be remembered that umbrellas were unknown at this time, and that Dr. John Morgan was the man who insisted upon their introduction as a matter of

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common sense, and he was the first to carry an umbrella in Philadelphia.

In the earlier years of his practice Bond probably did a good deal of work among the poor. The population of Philadelphia was rapidy increasing by immigration, and the authorities found it necessary to establish a form of detention house or lazaretto, on Province Island, below the city, down the Schuylkill River. Men who were his intimate friends were appointed physicians of the port: Dr. Patrick Baird, in the early portion of the century, followed by Dr. Thomas Graeme, and subsequently Dr. Lloyd Zachary. The brothers Bond doubtless had considerable experience, therefore, with the epidemics of yellow and typhus fever, which were introduced into Philadelphia through the medium of the immigrants. Bond refers to five epidemics in his introduction to his clinical lectures.

It has already been stated that Thomas Graeme and Lloyd Zachary were physicians of the port in Philadelphia. There is ample evidence to show that the Governor constantly requested Dr. Thomas Bond to accompany either one or the other of these physicians on board of suspected vessels. Thus, September, 1741, "Drs. Lloyd Zachary and Thomas Bond having by order of the two members of the Board, visited the ship *St. Mark*, with Palatines from Rotterdam, and reported the same to be sickly and to have infectious disease on board, it is ordered that the said ship remain at least one mile's distance from Philadelphia without landing any passengers or baggage till further orders." (*Colonial Archives,* vol. iv. p. 496.) In the following year Bond certifies to the state of health on board the *Constantine* "and that the vessel has been cleansed and aired in the likeliest manner." It is more than probable that Bond held this position of Inspector or Assistant Inspector for quite a number of years, and in 1747 he, in conjunction with Dr. Graeme, made a full report to the Council of Safety concerning the condition of contagious disease on board the ship *Vernon;* in this report they make numerous recommendations as to the isolation of sick patients and the fumigation and cleansing of houses in which illness has occurred.

If there was illness of a contagious nature on board vessels at that time it was customary to detain the vessels at Province Island and subsequently transfer the passengers to the pest house or lazaretto. In 1749, when Bond after having visited

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a vessel discovered contagious disease, the pest house was found to be in such miserable order that Councils recommended refurnishing and the building of outhouses for the accommodation of patients. In 1756 Bond acted as Coroner to Philadelphia city and county, being elected by the returns of October 4, 1756. I cannot ascertain how long he held this office.

The following are letters between Bond and the Council, writen in November, 1754, relating to business in the port:

"Doctor Graeme and I have spent this Day in examining the Palatines that have been Landed in and near the City, and shall as soon as possible give his Honour the Governor a particular Account of the Condition in which we found them, the Persons that nursed them, and the People living in the Neighbourhood of their Habitations; but the Security of the Citizens requiring the immediate removal of two Companies of them, I think it my Duty to give you this early Notice, that in the House of Philip Burcort, near the reformed Church, a considerable number of them, belonging to Daniel Benezett, are in a weak and diseased State, and are confined in so small a Room that the Air, etc., about them is in a high Degree of Putrefaction, and two of the Family are now ill of putrid Fevers. The People in the House of Frederick Burk, at Spring Garden, are circumstanced in the same manner; they belong to Henry Kepler. 'Tis my opinion that both the diseased and healthy Persons in both these Houses shou'd be removed to a considerable distance from the City, and care taken to purify the Houses well before other Tenants are permitted to go into them.

"THO. BOND."

Then follows a detailed report of the examination of the above houses and a discussion as to the character of the disease they were studying (probably a typhoid fever), and the conclusion that it was of non-contagious type, and they end with this plea:

"We cannot conclude this Resolution without saying our case is really a bad one, since a Security from Contagious Diseases is expected of Us, and the Legislature has not made the necessary regulations to prevent malignant Disease being generated by these people after they come into Port, where there is much more danger of it than at Sea.

"THOS. GRAEME.
"THOS. BOND."

During the early part of Dr. Bond's practice there was erected between Third and Fourth and Spruce and Pine streets the Almshouse, or what was properly known as "The Bettering House." About the middle of the century a much larger building was erected west of the Pennsylvania Hospital between Ninth

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and Tenth streets. There is no question about it that this institution had a hospital ward and that physicians were probably in attendance, but there is no record whatever that distinctive appointments of doctors were made until May 18, 1769, "when Dr. Cadwalader Evans and Dr. Thomas Bond were re-elected at a salary of Fifty Pounds a year, out of which they were required to furnish such medicines to the inmates as might be needed." (Packard's *History of Medicine in the United States,* p. 324.) It is altogether probable, however, that the Almshouse had a sick ward when it occupied its first site in the "Green Meadows." In 1770 the Managers of the Almshouse permitted Dr. Bond and Dr. Evans to instruct students in an obstetrical clinic, and this has been called the "first obstetrical clinic." In 1774 additional eminent physicians such as Kuhn, Rush, Duffield, Clarkson and Parke, were appointed to the staff, and so the hospital department became of first importance, both to the sick poor and as an adjunct to the new medical school. As late, however, as 1802 negotiations occurred between the Poor Directors and Hospital Managers about admission of patients from the Almshouse to the hospital. Morton considers it unlikely that they had medical wards till 1815.

He was justly celebrated as a lithotomist. He probably performed the first operation of this kind in America, although the credit has been given to Dr. Jones, of New York. There is no question, however, that Dr. Bond performed this operation successfully as early as October 29, 1756, in the Pennsylvania Hospital, and many times subsequently. An interesting light is thrown upon his skill as an operator by a contemporary writer in 1772, not a physician, and whose identity is unknown:[4] "I had the curiosity last week to be present at the hospital, at Dr. Bond's cutting for stone, and was agreeably disappointed, for instead of seeing an operation said to be perplexed with difficulty and uncertainty, and attended with violence and cruelty, it was performed with such ease, regularity, and success that it scarcely gave a shock to the most sympathizing bystander, the whole being completed, and a stone two inches in length and one in diameter extracted in less than two minutes." "If," adds the writer, "surgery is productive of such blessed effects, may we

[4] Norris' History of Medicine in Philadelphia, p. 26.

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not with Cicero justly rank it among the first of arts and esteem it worthy of the highest culture and encouragement?"

The following reference to the personality of Thomas Bond is found in a letter written by Charles F. Weisenthal, M.D., of Baltimore, to his son Andrew, who was studying medicine in Philadelphia, during the year 1781-82, two years before the death of Bond. He says:

"I am glad you have introduced yourself to Doctor Bond though he may have some Oddities, you may nevertheless rely on this that his acquaintance will be valuable to you, both his Learning and Experience are unquestionable, and he moreover is very communicative and takes a delight in instructing young Persons, and that in proportion to their Diligence and Application, you will therefore visit his Lectures frequently and freely apply to him to resolve such things as may be obscure to you, he is a good Surgeon besides and may give you some good hints in the hospital."

About a good thing, however, there may be a difference of opinion; in a letter from Dr. Barnabas Binney (the father of Horace Binney) to a friend, written in 1778, from a general hospital near Philadelphia, and filled with more or less gossip about his medical confreres, he says: "Kuhn, Rush, and old Bond I hear intend to lecture in ye Winter. Thank God I am done with them." (*Penna. Mag.*, vol. ii. p. 467.)

I have discovered that Thomas Bond in 1769 owned one hundred and twenty-four acres, four horses, four cattle, had three servants, and was taxed annually one hundred and sixty-nine pounds, ten shillings. Several years later he had increased his horses to six and cattle to ten. In the year 1780 the valuation of Dr. Thomas Bond's various properties in the Middle and Walnut Wards and the eastern and western parts of the Northern Liberties reached $208,000. He seemed to own about 400 acres of real estate at that time.

Phineas Bond, who was five years younger than Thomas, enjoyed the same preliminary education, but secured a more extensive European advantage than did his brother, for he studied for a considerable length of time at Leyden, Paris, Edinburgh, and London. According to Thacher, "He was not less disposed to form than well qualified to judge of every understanding for the improvement of the medical character of his country." He did not attempt to do any surgery and

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should be called a practitioner of internal medicine. He seems to have been a man of great personal charm, and according to Wistar's estimate no medical man in Pennsylvania "ever left behind him a higher character for professional sagacity or for the amiable qualities of the heart." He was one of the founders, together with Thomas Hopkinson, of the College of Philadelphia, now the University of Pennsylvania. He was also an original member of the Philosophical Society. Thacher quaintly says, "He was remarkable for conviviality but never habituated to intemperance."

PATIENTS AND PRACTICE.

The character of Dr. Bond's patients can be surmised from a study of his ledger, six volumes of which are to be found in the library of the College. These books are the daily records of the mutual practice of Drs. Thomas and Phineas Bond, and are labelled in ink on the outside "Co-Partnership Ledger of Drs. Thomas and Phineas Bond." They are long, narrow, leather-bound books, resembling the present-day cash books, and containing the accounts of the brothers from 1756 to 1770. In the first four volumes there is no daily visiting list, but in the last two volumes there is a daily list of visits and subsequent compilation of the individual accounts. Among his patients are to be found families whose names are still familiar in Philadelphia. I will mention some few of them:

Stephen Anthony, Thomas Austin, James Bard, John Bayly, James Biddle, John Burr, Nathaniel Chapman, James Claypole, Nathan Cleves, Henry Clifton, Jacob Cox, Benjamin Chew (Recorder), Joseph Davenport, William Duffield, Nathan Edwards, Jonathan Evans, Tench Francis (Recorder), Benjamin Franklin, William Franklin, George Gray, Alexander Graydon, John Guest, Alexander Hamilton, David Hamilton, Capt. John Hamilton, John Humphreys, John Inglis, Benjamin Kendall, Lynford Lardner, John Lober, James Logan, Thomas London, Jonathan Mifflin, Capt. Samuel Mifflin, Robert Morris (Financier), Samuel Morris, John Ord, John Palmer, James Payne, Israel Pemberton, Barthol. Penrose, Edmund Physic, Samuel Purveyance, Thomas Redman, Thomas Ritchie, Hugh Roberts, William Rush, Edward Shippen, Jr., Atwood Shute (Mayor), Enoch Stone, John Swift, Spencer Trotter, Richard Tyson, Col. Washington (George?), Joseph Wharton, Jr. (Recorder-

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Mayor), Daniel Wister, Richard Wister, Mordecai Yarnall, John Yeates, and Thomas York.

He seems to have done all varieties of surgery. I find records as follows:

"Opening breast and sundry dressings."

"Reducing and setting his son's fractured arm."

"Operation for fistula lacrymalis."

"Sundry dressings to his Dutch boy's fractured skull."

"Laying open and sundry dressings to his imposthumated liver."

"To scarifying his negro's mortifying feet, dressings, etc."

"To a visit to his place in ye night and delivering his negro woman of a difficult birth."

There also records of several castrations. He operated on May 27, 1765, on James Child, Jr., for stone, which was as large as a hen's egg and weighed two ounces, 2½ drachms. On December 10, 1765, he operated on a child of seven, Jeremiah Tracy, and removed a stone 1 ounce and 5 drachms in weight, which measured 1½ inches in diameter and 1⅞ inches in length.

He also did amputations, for in July, 1765, he amputated the leg of a negro named "Cuff," who was discharged later in the month cured. The negro's master paid the steward 60 pounds for board.

Some of the charges in his ledger are interesting. As is well known to you the attending physicians usually furnished the drugs, for which charges were made, and Dr. Bond was no exception to this rule. Dr. John Morgan was probably the American Lydgate to request his patients to secure his prescriptions at the drug store. I find charges for "Hausta anodyne," "gutta stomachicic," "antispasmodic julep," 3*s* 6*d*; "digestive ointments," "phlebotomies," and "epispastica," etc.

I can find no record of any abdominal operations. He, however, did perform paracentesis probably both on the chest and abdomen. It is apparent from a study of his work that he was a practitioner who believed in freely laying open abscesses or superficial growths. The prevalence of small-pox, especially among children, is also noted. He was up to date enough to practice inoculation, even though this operation was not yet fully regarded with confidence. He seems also to have been competent to diagnose measles.

I have found in Volume IV. of the accounts in the year 1765

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one or two quaint charges. "To my advice, attendance, and to hemorrhage spitting, 1 pound, 7 shillings;" "To opening her thigh, my advice, long and diligent attendance to her under several severe fits of illness, 2 pounds, 14 shillings." It is also evident that he either scarified or used incisions for the removal of dropsical effusions in the legs, as I find an item, "To tapping his legs, 10 shillings."

He was charitable. I find an account against a woman for 3 pounds, 6 shillings and 8 pence, upon which was paid 1 pound and 18 shillings, with the following remarks: "The rest remitted —a poor widow."

In Dr. George W. Norris' account of *The Early History of Medicine in Philadelphia,* p. 27, he states that Dr. Rush attributed to Dr. Bond the introduction and general use of mercury in practice in Philadelphia. He prescribes it in all diseases which resisted the common modes of practice. At this period bathing with either hot or cold water was but little employed in the treatment of acute diseases, and Dr. Bond is said to have been a liberal user of not only hot and cold baths, but vapor and warm-air baths, both of which he introduced into the practice of the Pennsylvania Hospital. This use of water was much more extensively employed later by Dr. Benjamin Rush.

Dr. Bond devised several surgical appliances; the one best known to us at the present time is the so-called Bond splint, which has been used many years, and in some hospitals still, for the treatment of fractures at the lower end of the radius. He also devised an instrument for the removal of foreign bodies from the œsophagus.

At a time when moving from house to house could not have been accomplished with any great ease, Dr. Bond seems to have been capable between the 60's and 70's of making at any rate from twelve to sixteen visits a day.

I find records in Dr. Bond's book of consultations with almost all of the prominent practicing physicians, Thomas Graeme, William Shippen, Sr., Dr. Kearsley, Cadwalader Evans, etc. There is reason to think that Bond not only attended but charged physicians and clergymen, as he has accounts against them which seem to have been settled. His ordinary charge for a phlebotomy was 2*s* 6*d*. He did a great deal of inoculating, and, as has been before stated, his charges for this service were high (To Mr.——, inoculating his child, medicines, and attendance, £4 1*s*). He

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had great numbers of military men on his book, captains and colonels.

He visited many of the suburbs, going as far as Haddonfield, Mt. Holly, Gloucester, Chester, Darby, Marcus Hook, and John's Woods. It can therefore be seen that his practice included many of the more prominent people of Philadelphia, for many of the names given above are of men prominent in government, banking, business, and social life.

It is probable that during the troublous times before the Revolution both Thomas and Phineas Bond were Loyalists. Phineas, you may recall, died in 1773. In Sabine's *Biographical Sketch of Loyalists,* p. 236, I find sketches of both Thomas and Phineas Bond; he quotes a letter from Chief Justice Shippen to his father at Lancaster, written January 8, 1758, as follows:

"Our assembly have taken up William Moore and the Provost, and put them into custody for writing a libel against the former assembly. Thomas Bond and Phineas (Bond) were on the point of being committed on the same account. The latter was actually in custody of the Sergeant-at-Arms, but afterwards discharged. How the matter will end is yet uncertain."

As the Revolution drew near it is probable that Thomas became more weak-kneed in his opinions and finally became a Whig. It remained for Phineas Bond, Jr., however, to become an active Loyalist or Tory and I find in the *Pennsylvannia Colonial Records,* vol. xi. p. 284, evidences that Phineas, Jr., was included among those "who have in their general conduct and conversation evinced a disposition inimical to the cause of America." In the following month Dr. Thomas Bond requested that Phineas Bond, Jr., be permitted to go to Virginia under parole and thence to the West Indies; this was granted. The following year Phineas, Jr., was held on his parole. He was considered guilty of high treason and his property confiscated, for I find records of debts against the estate of Phineas Bond, forfeited to the Commonwealth by his attainder of high treason in 1787. In May, 1787, there is an acknowledgment by Congress of the appointment of Phineas Bond as Consul for His Britannic Majesty from the Middle States. The following year he returned to America, continued in office for a considerable number of years, and subsequently died in 1812 in England.

LITERARY WORK

There is but little of his literary work to be discovered. I

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have found one article of his, published in 1754 in *The Medical Observations and Inquiries,* vol. i. p. 68, with a most unusual title, as follows: "A Worm, and a Horrid One, Found in the Liver." This article is a letter written to Dr. Clephane, of London, describing a case occurring in a Mrs. Holt, of Philadelphia, detailing her symptoms, which extended over about eighteen months, the passage of a supposed intestinal parasite, description of the autopsy accompanied by an engraving of the post-mortem appearance of the abdomen and the supposed worm. The case impresses me as probably one of subphrenic abscess or abscess of the liver. I have no knowledge of such a parasite existing as is depicted in the illustration. That he wrote other articles is certain, yet it remained for the Managers of the Pennsylvania[5] Hospital to preserve in full his introductory lecture to a course of clinical lectures delivered at that hospital. This lecture was primarily read at his own house November 26, 1766, to the Managers and some of the physicians of the hospital and thirty students, and was probably re-read at the hospital on December 3, 1766, at the inauguration of the clinics. The Managers thought so highly of it that it was spread in full upon the minutes and only in that way preserved. It is to be found in full in the *History of the Pennsylvania Hospital,* by Thomas G. Morton, and was also republished in 1827, by Paul Eve, a then student of the Pennsylvania Hospital, in the *North American Medical and Surgical Journal,* vol. iv., and is copied in full in Norris' *History* and also in F. R. Packard's work.

A second paper in the *Medical Observations and Inquiries,* vol. ii. p. 265, by Thomas Bond was "On the Use of Peruvian Bark in Scrofulous Cases." In Atkinson's *Medical Biography,* p. 312, under the head of "Bond" (without first name) "An 8vo: Essay on the Incubus or Nightmare, published in 1753." His comments on this article are remarkable: "A bond in judgment against sleep, and a very awkward mare to ride. She generally has the upper hand of the jockey, turning the gray mare into the better horse. But the great misery is, that this happens in the dark, and there is nobody to help him—do not buy such a mare—*cæveat emptor.*"

In addition to the previous papers Bond made quite a number of communications, usually of a medical nature, before the Philo-

[5] See the inscription on his tomb, and letters to the Managers of the Pennsylvania Hospital.

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sophical Society; thus, on August 16, 1771, he read a letter from Dr. Normandie regarding "A Case of Abscess of the Lungs of Long Standing, Attended with Very Alarming Symptoms, Remarkably Relieved during This Season by Drinking and Bathing in the Bristol Waters." On June 17th, the following year, he read an essay on (*a*) "Epicacuanhæ;" (*b*) "A Description of Plants at the Cape of Good Hope (Dr. Burgeus)"; (*c*) "Dr. Landiford's Account of the Epidemic at Barbadoes." In 1779 he read a paper on "The Means of Pursuing Health and Preventing Disease." Two years before his death (on May 21, 1782) Bond delivered the Annual Oration at the State House before the Philosophical Society; he began as follows: "The principal Settlers of Pennsylvania were Emigrants from Great Britain and Ireland, who quitted their native Countries, Beds of Ease and Fields of Plenty, underwent the Perils of a wide and boisterous Sea, risked the Barbarity of Savages, and located themselves in Deserts and Forests, filled with deadly Serpents and Beasts of Prey, solely for the Enjoyment of Religious Liberty.

"And as they brought with them the Principles of Peace and universal Benevolence, and inviolable attachment to Justice, and a Striking Purity of Manners, they soon softened the Pagan Hearts of the Natives to such Humanity and Affection, that they gave up to them their Caves for Habitations, supplyd them with food, and even robbed their own children of the Mothers Milk to support and cherish their languishing Infants."

He then gives a hasty sketch of the origin of the Philosophical Society, and passes on to the subject of his Oration: "The Rank and Dignity of Man in the Scale of Being" and the sub-title "The Conveniences and Advantages He derives from the Arts and Sciences, and A Prognostic of the Increasing Grandeur and Glory of America, founded on the Nature of the Climate."

The address concludes as follows: "Military Fame may be won or lost in an hour, but the fame of Science is a character of Duration. It is the Child of a thousand years, approaching slowly to Maturity, and is long in dying."

"The Fame of America must rest on a broader basis than that of Arms alone. Is the just, mild, generous, grateful and learned, as well as brave, will soon be the Enquiry of the World. Curiosity, which leads Mankind to know every minute Circumstance of a new Character, will naturally excite these Questions, and we cannot too seriously reflect, that our Consequence Abroad,

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depends upon our preserving a noble, generous and *unspotted character* at Home."

This is a small book of 34 pages, and the address is distinctly scholarly; barring a few references to the use of new instruments for the measurement of atmospheric pressure, temperature, etc., which he always considered of great importance, there is little reference to things medical.

HIS INTEREST IN THE PENNSYLVANIA HOSPITAL AND MEDICAL INSTRUCTION IN THE SAME.

It is probable that Dr. Bond, from the nature of his practice, daily realized the help and aid that a hospital with its appliances, dressers, nurses, etc., would be to him in his work. It is an assured fact that he certainly talked to his patients and his friends more or less constantly about his hopes of the foundation of a hospital for the care of the sick and injured, to say nothing of the care of the insane, for really during the first years of the hospital much of its work consisted in the care of the so-called "lunatics." There were, however, other physicians who were equally as interested and anxious to aid in such a worthy project. At this time the prominent practitioners in Philadelphia included Drs. John Jones, Graeme, Cadwalader, Moore, Redman, Chovet, Lloyd Zachary, Witt, Kearsley, Jr., and Colden. It was not, however, until Bond approached Benjamin Franklin and explained to him the value that such an institution would be to the community, that any material progress was made in the scheme of the foundation of a hospital. Franklin, in fact, has often been credited with the honor of being the founder of the Pennsylvania Hospital, but he settles this question positively in his *Autobiography,* in which he says:

"In 1751, Dr. Thomas Bond, a particular friend of mine conceived the idea of establishing a hospital in Philadelphia (a very beneficial design, which has been ascribed to me, but was originally and truly his), for the reception and cure of poor sick persons, whether inhabitants of the province or strangers. He was zealous and active in endeavoring to procure subscriptions for it; but the proposal being a novelty in America, and at first not well understood, he met with but little success.

"At length he came to me with the compliment, that he found there was no such thing as carrying a public-spirited project through without my being concerned in it. 'For,' he said, 'I

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am often asked by those to whom I propose subscribing. "Have you consulted Franklin on this business? And what does he think of it?" And when I tell them that I have not (supposing it rather out of your line) they do not subscribe, but say they will consider it.' I inquired into the nature and probable utility of the scheme, and receiving very satisfactory explanation, I not only subscribed to it myself, but engaged heartily in the design of procuring subscriptions from others. Previously, however, to the solicitation, I endeavored to prepare the minds of the people by writing on the subject in the newspapers, which was my usual custom in such cases, but which he had omitted."

Bond's interest in the promotion of the Pennsylvania Hospital in its early days is everywhere evident from the minutes of the Managers; thus, on September 5, 1751, "The President and Thomas Bond are requested to consider some of the methods to begin the hospital in a private house so as to accommodate a few patients in order that at least some good might be doing in the meantime until the hospital is built." (Morton's *History*, pp. 27, 28.) The house of Judge John Kinsey, on the south side of Market street below Fifth (in 1811 known as 172 High street), with its gardens, pasture, and stable were leased for a sum of forty pounds per annum and twenty-five pounds were appropriated for repairs upon the same. This sum was subsequently found insufficient and one hundred and fifty pounds had to be borrowed from the one thousand pounds of the Provincial Grant. Then came the question of the selection of physicians, and on October 23, 1751, we find that "Doctor Lloyd Zachary and Doctors Thomas Bond and Phineas Bond signified their willingness: to give their attendance gratis in taking care of the sick as physicians and surgeons for the first Three Years." The temporary hospital received its first patient on February 10, 1752. It was an imposing occasion, for on this day a special meeting was called to consider the application for admission of patients into the wards for treatment. "Doctors Graeme, Cadwalder, Moore, and Redman were invited to meet the attending Managers and attending physicians to assist in the selection of the most deserving cases." Margaret Sherlock's disorder was considered relievable and her case suitable, so this woman was the first admission and she was also the first discharged cured. Alice Courent was engaged as a maid or nurse at ten pounds per annum. Subsequently "Israel Pemberton and Thomas Bond were desired to look out for a

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suitable matron to take care of the house and the sick that shall be placed there." (Morton's *History*, p. 28.)

The attending physicians were, by the rules, supposed to attend the hospital Mondays and Thursdays every week at ten o'clock in the morning, where they met the visiting Managers, admitted cases, etc. It was a rule of the hospital that prior to admission of patients they must be visited by the attending physicians. This practice seems to have been followed for many years. It must have taken a grevious amount of time, and finally the staff rebelled, for in 1802 a request, seconded by Benjamin Rush, Philip Syng Physic, John Redman Coxe, Benjamin Smith Barton, and Caspar Wistar, Jr., was sent to the Managers, suggesting that this rule be dispensed with "on account of numerous and prior engagements of said physicians," and asking they be permitted to send an assistant for the purpose of visiting and examining the sick applicant. The Managers refused this request. With the birth of the hospital the following curious resolution was passed, showing the characteristic prudence of the Managers; it stated that the attending physicians "shall first give demonstration of their skill and ability in anatomy, operations, dressings, and bandaging before the Managers and such others as the Managers might see fit." It is doubtful if this rule was ever enforced.

It may be opportune to remind you of several of the astute methods practiced by Franklin in his attempt to secure the passage of an appropriation for the hospital by the Provincial Assembly. He was desirous to secure an appropriation of about £2000, and he felt positive that such a sum would probably not meet with approval. He therefore adopted the sagacious scheme, now so frequently utilized by Andrew Carnegie, of asking the Assembly to grant the sum if the promoters of the hospital scheme would raise a similar sum among those interested in the project. As a matter of fact Benjamin Franklin and the hospital's friends had already more than that sum pledged, and the Provincial Assembly, when such a proposition was made to them, eagerly swallowed the bait and passed the bill without any objection, little thinking that the money so awarded to the hospital would be picked up at once and utilized. Another of the objections raised to the hospital was that they could not afford to pay the physicians for their attendance upon the sick. Franklin met this objection by the announcement that the physicians had offered "to attend the patients for nothing and supply all the medicine

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for three years at their own expense." This generous example, set by the brothers Bond and Lloyd Zachary, has been followed by generations of their successors, and practically by all other hospital physicians and surgeons since that time throughout the entire United States.

So the hospital began its life, and Bond was active in all its departments; he saw the necessity of introducing students into the wards and soon had a class of ward dressers following at his heels. These students were charged a small sum for the privilege and the money secured in this way was turned in to the Managers and placed in the so-called "Medical Fund," which became the nucleus of the purchase of the library. This fund in subsequent years became large and was used not only for the purchase of books but at times for some of the hospital improvements. Bond also drew up the certificates presented to the students as an acknowledgment of the completion of a course of attendance upon the hospital clinics. He was also active in securing drugs and finally importing a druggist and the establishment of the drug store.

He was deeply impressed with the necessity of clinical instruction for medical students and had probably repeatedly urged this matter upon the attention of the Managers of the hospital. It was not, however, until 1766 that his suggestions were acted upon by the Managers, and a regular course of clinical lectures begun. He courteously invited the Managers to his house to hear his "Essay on the Utility of Clinical Lectures." This he read in the presence of the Managers, several physicians and thirty students on November 26, 1766. His arguments seem to have overcome whatever objection they had to a course of clinical instruction, and the introductory lecture was probably a repetition of the essay. It was read at the hospital on December 3, 1766. This essay embodies so much that is good that I shall here give a short abstract of it:

"When I consider the unskilful hands the practice of Physic and Surgery has of necessity been Committed to, in many parts of America, it gives me pleasure to behold so many Worthy Young Men, training up in those professions, which, from the nature of their Objects, are the most interesting to the Community, and yet a great pleasure in foreseeing, that the unparalleled public Spirit, of the Good People of this Province, will shortly make Philadelphia, the Athens of America, and Render the Sons of

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THOMAS BOND, M.D.

1712-1772.

(From an engraving in the College of Physicians of Philadelphia.)

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Pennsylvania, reputable amongst the most celebrated Europeans, in all the liberal Arts and Sciences. . . .

"No country then can be so proper for the instruction of Youth in the Knowledge of Physic, as that in which 'tis to be practiced; where the precepts of never failing Experience are handed down from Father to Son, from Tutor to Pupil."

He commends the teaching of anatomy, physiology, and the theory and practice of medicine, but feels they must be supplemented by clinical teaching.

"There, the Clinical professor comes in to the aid of Speculation & demonstrates the Truth of Theory by Facts; he meets his Pupils at stated times in the Hospital, And when a case presents adapted to his purpose, he asks all those Questions which lead to a certain knowledge of the Disease, & parts Affected, this he does in the most exact and particular manner, to convince the Students how many, & what minute Circumstances are often necessary to form a judgment of the Curative indications, on which, the Safety & Life of the Patient depend, from all of which Circumstances and the present Symptoms, he pronounces what the Disease is, whether it is Curable or Incurable, in what manner it ought to be treated, and gives his reasons from Authority or Experience for all he says on the Occasion; and if the Disease Baffles the power of Art, and the Patient falls a Sacrifice to it, he then brings his knowledge to the Test, & fixes Honour or discredit on his Reputation by exposing all the Morbid parts to View, and Demonstrates by what means it produced Death; and if perchance he finds something unsuspected, which betrays an Error in Judgment he like a great and good Man, immediately acknowledges the mistake, and for the benefit of survivors, points out other methods by which it might have been more happily Treated; The latter part of this Field of Tuition is the surest method of obtaining just Ideas of Diseases."

This is an exceptionally fine argument for the study of clinical medicine; it shows also the type of man that Bond was, perfectly willing to acknowledge his mistakes and to benefit by a study of morbid anatomy at all times. He further comments upon the necessity and usefulness of autopsies; states that the only objection to North America as a place to live is that the climate is sometimes productive of severe epidemic diseases in the summer and in the fall, and he feels an attempt should be made "to wipe this stain out of the American escutcheon." He further

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discourses on the difference between yellow and typhus fever and the agues, and the necessity for their very careful study, so that isolation, prevention, etc., may be accomplished. He remarks on some of the methods for preventing diseases, such as the wearing of flannel shirts (this, you may well recall, was a fad of Benjamin Franklin); the use of sassafras bark, and the use of certain chalybeate springs in the treatment of disease. His concluding paragraph is as follows:

"I there purpose to meet you at stated times here, & give you the best information in my Power of the nature & treatment of Chronical Diseases, and of the proper management of Ulcers, Wounds, & Fractures, I shall show you all the Operations of Surgery, & endeavour, from the Experience of Thirty Years to introduce you to a Familiar acquaintance with the acute diseases of your own Country, in order to which, I shall put up a compleat Meteriological Apparatus, & endeavour to inform you of all the known Properties of the atmosphere which surrounds us, and the effects its frequent variations produce on Animal Bodies, and confine the Doctrine, by an Exact register of the Weather, of the prevailing Diseases, both here, & in the Neighbouring Provinces, to which I shall add, all the interesting observations which may occur in private practice, & sincerely wish it may be in my power to do them to your Satisfaction."

These clinical lectures were successful in attracting students and with the exception of the interruptions of the troublous times of the Revolution and the Rebellion, have been continued by Bond's successors down to the present day. The attending students were primarily charged a guinea for the year's attendance (1766). In 1774 this sum was raised to five pounds to all students not apprenticed to physicians. In the first year sixteen students attended the clinics, and thirteen pounds, twelve shilling were turned in to the Managers by Dr. Bond, and thus became the nucleus of the Medical Fund. Again, in the year 1769-70, a list of sixteen students was handed in to the steward by Dr. Bond.

About this time also Dr. Bond requested permission to establish a meteorological apparatus in one of the hospital rooms and in this same letter to the Managers he stated: "A neat copy of which (epidemic diseases) with an account of all the curious cases which presented in the hospital, I will annually deposit in the library for the perusal of Posterity." I have searched the

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older volumes in the library in the Pennsylvania Hospital but have been unable to find these records. It would indeed be intensely interesting if they could be discovered, as they probably would give us definite ideas as to the methods of physical examination and modes of treatment used at that time in the Pennsylvania Hospital.

This time, that is 1765, marked the beginning of systematic medical instruction in the United States; this year's courses in anatomy and surgery (and midwifery) were given by William Shippen, Jr., and lectures on physic by John Morgan. Dr. Bond taught clinical medicine the following year, and continued to hold clinics at the Pennsylvania Hospital till his death. As will be remembered, the appointment of Morgan and Shippen was soon followed by that of Rush and Kuhn to the respective chairs of Chemistry and Materia Medica and Botany. Bond was, however, at this time a man of fifty-four, whereas his associate professors were all men of thirty, or under, years of age.

At the foundation of the medical school "It is pleasant to contemplate the attitude of the older practitioners toward these younger and more cultivated brethren. The elections were reported to have been unanimous, notwithstanding that among the Board of Trustees were all of the old leading physicians. It looks well that after a course of lectures by these two young men (Shippen and Morgan) the veteran Thomas Bond came in from the Pennsylvania Hospital and began his course of clinical lectures." (Scharf and Westcott, vol. ii. p. 1588).

SERVICES IN THE MEDICAL DEPARTMENT OF THE COLONIAL ARMY.

Bond was appointed, together with Drs. Cadwalader, Richard Rush, and William Shippen, Jr., on January 9, 1776, as one of the examining surgeons of the Colonial Medical Department. The Council ordered that no certificates were to be granted to surgeons coming up for examination unless signed by three of the above men. His son, Thomas Bond, Jr., was a surgical mate in the army and had charge in 1776 of the wounded at Elizabethtown, New Jersey. From there he wrote to his father, then in Philadelphia, asking him to consult General Mifflin regarding the establishment of hospitals for the sick at Darby, Chester, Marcus Hook, Wilmington, and Newcastle. The senior Bond at once

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wrote to the Council of Safety, December 4, 1776, suggesting "that the Pennsylvania Bettering House and the Provincial Hospital may accommodate them," coupled with other suggestions regarding means for their medical care, provisions, drugs, etc. (Toner's *Medical Men of the Revolution,* pp. 52, 53.) The following day the Council resolved "That the Pennsylvania Hospital be taken up and employed for the sick troops of the Continental Army in compliance with the request from Congress that the said troops be provided with medicines and every necessary." (*Pa. Colonial Records,* vol. xi. p. 34.)

It is probable that both father and son were active in organizing the hospital system in and about Philadelphia. "The senior and junior Drs. Thomas Bond rendered efficient aid in organizing the hospital system on a proper basis and securing competent surgical and medical aid." (Scharf and Westcott, vol. i. p. 332.)

Dr. Thomas Bond, Jr., A. D. G. of the Continental Hospital, appears in the records of the Pennsylvania Hospital in September, 1778, applying for the admission of a large number of convalescing soldiers to the Pennsylvania Hospital, to remain under the care of their physicians and surgeons, to which proposition the Managers objected. Later on, in April, 1779, Dr. Bond, Jr., again requested the use of the lower ward and corridor for convalescing soldiers for a period of not longer than six weeks, which was granted, and we find on June 16, of the same year, Dr. Bond, Jr., returning thanks for the use of the hospital for that purpose. Again, in July, 1781, Dr. Thomas Bond, Jr., proposed that "all the British prisoners now sick in the jail, about ninety of them, be admitted as pay patients, and in future all the sick belonging to the army or any of their sick persons shall at all times be admitted on the same footing; the number would average about 40 or 50." The Managers informed him that no malignant disease could be admitted, and his reply was that "they must take all or none." In November, 1783, he made a personal application to have "all the diseased soldiers, their wives and children now in the Continental Hospital, admitted to the Pennsylvania Hospital upon the usual terms," which the Managers declined to do. As far as the Pennsylvania Hospital records are concerned, the last we heard of Dr. Bond, Jr., are letters from Robert Morris, December, 1783, relating to an application made to the last Board by Dr. Bond, Jr., for admission

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of a number of diseased Continental soldiers whom they agreed to admit subject to the rules of the hospital.

During the Revolution I find that Bond used ordinary powder for disinfection of the hospitals. In March, 1779, he was granted by Councils two pounds of powder to be burned in disinfecting the Work House.

OFFICIAL RELATIONS TO SOCIETIES, INSTITUTIONS, ETC.

Thomas and Phineas Bond were both original members of the Society for the Promoting of Useful Knowledge among the British Plantations (1744). You may recall that the other founders of this Society were John Bartram, the botanist; Thomas Godfrey, mathematician; Samuel Rhodes, mechanician; Wm. Parsons, geographer; Thomas Hopkins, President; William Coleman, Treasurer, and Benjamin Franklin, Secretary.

In this bevy of worthies Thomas Bond was the physician, while Phineas represented general natural philosophy.

As the years went on this Society became merged in the American Philosophical Society (1767-68), and Thomas Bond was for years its Vice-President; as before stated, he at intervals contributed to the program of the meetings, usually in the form of letters from foreign medical men or those stationed in foreign ports.

Bond was a member of the Masonic Order; in 1749 he was appointed Deputy Grand Master by Franklin.

He was also president of a Humane Society, which had as its object the restoration of the drowned.

He was among the original Trustees of the Academy, later the College of Philadelphia, and later the University of the State of Pennsylvania, from which finally came the present University of Pennsylvania.

He was one of the original members of the Board of Managers of the Pennsylvania Hospital.

One of the common reports frequently reproduced in regard to Thomas Bond is the statement that he was appointed Professor of Clinical Medicine in 1768. It is probable that this error arose in this way: Dr. Bond was one of the Trustees of the Academy and subsequently University of the State of Pennsylvania; it was not customary at that time for a man to act both as Trustee and as Professor in one of the schools; thus some years later Dr. Caspar Wistar was a Trustee of the University and yet was lec-

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turing for some seven years before he resigned his Trusteeship and accepted the Professorship. This is probably the reason that no record of Dr. Bond's appointment in the University of Pennsylvania can be found upon its minutes. I do, however, find the following in the minutes of the Trustees of the University of Pennsylvania under the date of May 17, 1768: "Dr. Thomas Bond is requested by the Trustees and Professors to continue his Clinical Lectures at the Hospital as a branch of Medical Education adjudged to be of great Importance and Benefit to Students." It is probable, therefore, that any appointment which came to Bond came in later years, for in 1779 the charter of the College and Academy of Philadelphia was abrogated and the University of the State of Pennsylvania began its career on October 31, 1781. On that same day "Dr. Bond is requested to unite the Lectures of the Theory and Practice of Physic with his Course of Clinical Lectures," which he accepted.

PERSONAL APPEARANCE, PORTRAITS OR PICTURES.

It is difficult to secure much of an estimate of Dr. Bond's general appearance, physique, etc. Of this Thacher (*American Medical Biography*, p. 117) says: "By nature Dr. Bond was of delicate constitution and disposed to pulmonary consumption for which he went a voyage when a young man to the Island of Barbadoes. By unremitted care to his health, the strictest attention to diet, and to guard against change of temperature and also by frequently losing blood when he found his lungs affected, he lived to an age which the greater part of mankind never reached."

Until recently it was supposed that no picture or portrait of Bond existed; Morton, in his *History of the Pennsylvania Hospital*, states that he was unable to find a picture of him; William A. Armstrong, who aided Dr. Morton, writes me that every clue was run to the ground without success; an engraving (see *Plate 1*) has been found but which has been objected to on the ground of the costume being of too recent a date to have been worn by Bond; it cannot be Thomas, Jr., as he died at fifty; if it is not the medical Thomas Bond, who is it?

Until the history of this picture can be definitely ascertained I shall assume that this is the portrait of our Bond.

The second portrait has a much more uncertain history; it is the property of Dr. William Pepper, and was found among

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the effects of his father, the late Dr. William Pepper; it is a painted miniature, with heavy black oval frame, on the wooden back of which is written "Dr. Thomas Bond." (See *Plate 2.*) Accompanying it was a medallion of Dr. John Fothergill, the well-known London physician and a friend of Dr. Bond.

Nothing whatever is known about the previous history of the picture. Dr. Pepper has kindly permitted me to have it photographed, and it is here reproduced.

The signature below the first picture bears some resemblance to those of Bond's at the Pennsylvania Hospital and in the co-partnership books; this is a more carefully written signature and with less boldness; he usually signed "Th. Bond," with rather heavy lines.

The cause of Dr. Bond's death is unknown. While he was considered rather a delicate man he, however, was able to persist in his medical work until within several weeks of his death. It seems probable, therefore, that he died of some acute disease or of one of the common terminations of the aged, on Friday, March 26, 1784, at the age of seventy-two. He was buried on Sunday in the burial-ground of Christ Church, at Fifth and Arch streets.

The following is a portion of an obituary notice of Dr. Bond which appeared in the *Pennsylvania Gazette* of April 3, 1784:

"A complete medical education; a natural love of science, and activity in business; an intrepidity in the undertaking of difficult cases, accompanied with uncommon success in execution; and added to these a long and increasing experience; such as perhaps became at last too fatiguing for the repose due to the close of a life devoted to honorable industry. But considering the employment of his profession as the calls of duty, he resolutely sustained the hardships of it until a few weeks of his decease, to which period, notwithstanding a constitution naturally delicate, he enjoyed a degree of health, uncommon for his years, the result of his strict temperance."

His grave, which is No. 37, Section O, is marked by a low, flat marble tablet. His name, age, and date of death are still easily read, but the inscription under the name has become illegible by time. I find, however, from previous records that it reads as follows:

"In memory of Thomas Bond, M.D., who practised Physic and Surgery with signal reputation and success nearly half a

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Century, lamented and beloved by many, respected and esteemed by all, and adorned by literary honors sustained by him with dignity. He departed this life March 26, 1784. Aged 72 years."

He died, therefore, some few years before the foundation of this College. Had he lived he unquestionably would have been one of its founders, as he was a contemporary and friend of many of the men whose names are seen upon our Founders' Tablet.

The Managers of the Pennsylvania Hospital were careful in bestowing unnecessary compliments or flattery upon those who had been their medical advisers. I do not find in their minutes any record or memorandum of the death of either Phineas or Thomas Bond. At the subsequent meeting a successor was elected and no resolutions of sympathy, etc., were passed. On January 12, 1831, the Managers of the hospital passed the following: "Resolved, that the twenty-five foot street intended to be laid out in the preceding resolution, shall be named Bond street in grateful recollection of the early, long, and faithful services of Drs. Thomas and Phineas Bond, as physicians to this institution." This street, as you all know, extends from Ninth to Eleventh streets, between Spruce and Pine, and has been for years known to us as Clinton street. I do not know why the name was changed.

In the will of Thomas Bond proven his property is bequeathed to his wife Sarah and his sons Thomas and Venables and to his two daughters, Elizabeth Martin and Rebecca Lawrence; it was witnessed by Samuel Morris, John Swift, and Benjamin Chew. After making the ordinary bequests to his family he gave several of his negro servants their freedom. It is probable that Bond's widow, Sarah, died shortly after his death, for I discovered in the record of burials in Christ Church, that Mrs. Bond, a widow, the husband's name, however, not given, died September 19, 1784.

The foregoing comprises what I have been able to ascertain from various sources about Thomas Bond. His interest in life was widespread, his daily round including the caring for wounds, injuries, broken bones, etc.; the diagnosis and nursing of dangerous and contagious diseases, such as typhus fever and smallpox; and between times he dabbled with philosophy and philosophers, such as Franklin and Bartram, and dined with learned men, savants.

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A MINIATURE, THE BACK OF WHICH BEARS THE NAME, "THOMAS BOND," FOUND AMONG SOME PAPERS OF THE LATE DR. WILLIAM PEPPER.

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Toward the end of a useful life he devoted his last years to the service of his country; certainly before this time much of his life had been spent in the service of the medical profession of the city of Philadelphia. I therefore consider that I am at liberty to honor him as Thomas Bond, founder of the Pennsylvania Hospital, originator of the American clinic, an upright Philadelphian, and a true patriot.

THE ALLEGED DEDICATION OF MORGAGNI RECOGNIZING KINSHIP TO JOHN MORGAN.

By George Dock, M.D.,

Ann Arbor, Mich.

ALMOST all accounts of the life of John Morgan, of Philadelphia, founder of the Medical Department of the University of Pennsylvania, mention his visit to the celebrated John Baptist Morgagni, at Padua, and state that the venerable anatomist, in presenting a copy of his great work, "De Sedibus et Causis Morborum," wrote a dedication referring to the similarity of their names. So frequently has this been repeated, and so rarely has it been questioned, that I was as much interested as surprised when my friend, Dr. C. W. Dulles, wrote me casting doubt upon the legend and stating that there was no such inscription in the copy of Morgagni's works presented by John Morgan to the Library of the College of Physicians, and preserved there as one of the greatest treasures of that splendid library. It seems to me that the matter, trifling from one point of view, has a certain interest, not only to the student of medical history, but also to all who care for historical accuracy in general.

The earliest appearance of the legend is usually attributed to the *Philadelphia Journal of the Medical and Physical Sciences*, 1820, Vol. I, pp. 439-442. Through the kindness of the Editor of the Medical Library and Historical Journal I have learned of an earlier publication, identical in title and contents, in *The American Museum or Repository of Ancient and Modern Fugitive Pieces, etc.*, Vol. V, 1789. This is mentioned, but with a misleading typographical error, by Ruschenberger. The article is headed: "An Account of the Late Dr. John Morgan. De-

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livered before the Trustees and Students of Medicine in the College of Philadelphia, on the 2d of November, 1789, by Benjamin Rush, M.D." The passage that interests us is as follows: "This venerable physician" (Morgagni was 82 years old), "who was the light and ornament of two or three successive generations of physicians, was so pleased with the doctor, that he claimed kindred with him, from the resemblance of their names, and *on the blank leaf of a copy of his works,*[1] which he presented to him, he inscribed with his own hand the following words: 'Affini suo, medico præclarissimo, Johanni Morgan, donat auctor.'"

This passage has been quoted by most writers on American medical biography without question. Besides Dr. Dulles, the only one, so far as I can learn, who has discredited the statement is the late Dr. W. W. Ruschenberger. Dr. Dulles merely denies that the inscription exists. Dr. Ruschenberger went farther. In his "Account of the Institution of the College of Physicians of Philadelphia,"[2] he says: "By whose invention Dr. Rush was made the author for this fanciful tale is not now known. Dr. Morgan's account of his visit to Morgagni suggests nothing of the kind." Dr. Ruschenberger therefore declares the story an invention and seems to think Rush had been deceived by it, but if he had any evidence in the matter it seems that he should have produced it. Morgan died October 15, 1789. The "Account" is said to have been read on the 2d of November following. The time was a natural one for such an event, and Rush the logical choice for a speaker, having been elected to Morgan's chair of Theory and Practice of Medicine. I can find nothing to show that Rush was not the author of the "Account." It would seem that even when it was republished in 1820 there must have been many persons alive who could have remembered the eulogy and who would have questioned any erroneous statement in the published report. Moreover, it seems as if there must have been some who would have questioned the statement about the inscription if there was no basis for it. On the other hand, of course, indifference may have prevented such objections from seeing the light. However this may be, the alleged incident was soon accepted by

[1] Italics are mine.—G. D.

[2] *Trans. Coll. Phys. of Phila.*, 1887, p. 31.

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writers, such as Thacher,[3] Carson,[4] Samuel Jackson,[5] Norris,[6] and others. Referring to the "Account," Jackson says:[7] "This memoir is believed to be nearly all that is attainable concerning the life of a highly educated and strong man in the profession." The *North American Medical and Surgical Journal*, in 1827, quoted[8] Dr. Rush's statement, in a long article on Dr. Morgan, unsigned. The editors of this journal were Hugh L. Hodge, Franklin Bache, Chas. D. Meigs, B. H. Coates and R. La Roche. All these men were familiar with the Library and it does not seem that they would have overlooked or countenanced an invention such as Ruschenberger assumes.

As regards the non-existence of the inscription, this does not prove that there never was one. Dr. Dulles is correct in saying there is no such inscription as the one quoted in the copy of Morgagni's book presented by Morgan to the College of Physicians in 1788 or 1789. Each of these two volumes bears an inscription on its title page, as follows:

Vol. I. "Viro Experientissimo et Humanissimo. D. Dr. Joanni Morgan auctor."

Vol. II. "Viro de Re Anatomia bene merito. Dº. Dr. Joanni Morgan auctor."

The existence of these inscriptions does not affect the probability of the other one, since these are on the title pages, whereas the other is expressly stated to have been on the "blank leaf." The blank leaves or fly leaves of the volumes have long since disappeared. The volumes were badly affected by mold and new fly leaves were inserted many years ago. The accomplished Librarian of the College of Physicians of Philadelphia, Mr. Charles Perry Fisher, has no recollection of the time the repairs were made. He also does not recall hearing anything regarding the state of the leaves or the inscription from older Fellows of the College nor have I been able to hear of any one who has such knowledge.

Ruschenberger's statement that Morgan's account of his visit suggests nothing about the inscription does not seem very

[3] American Medical Biography. *Boston*, 1828. Vol. I, p. 406.

[4] History of the Med. Dept. of the Univ. of Penn. *Phil.*, 1869. Page 46.

[5] In: Lives of the Eminent Amer. Physicians and Surgeons of the Nineteenth Century. Edit. by S. D. Gross. *Phil.*, 1861. Page 34.

[6] The Early Hist. of Med. in Philadelphia. *Phil.*, 1886. Page 53.

[7] *Loc. cit.*

[8] 1827, iv, p. 365.

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conclusive. The whole account covers only four pages folio, as I learn from the Librarian of the Historical Society of Pennsylvania, Mr. John W. Jordan. It shows that the two men not only discussed scientific matters but that Morgagni became so friendly as to speak of intimate family details. There seems no reason why Morgan should mention the inscription if he had it in the book. He did not mention the other inscriptions, and was so careless as to write the title in two places: "De sede et causis morborum." The statement that it was put on the fly-leaf suggests that the inscription might have been written as an afterthought, the more formal dedications having been written previously on the title pages. The addition of the "h" in "Joanni" does not seem material in the present state of the case.

A minor but interesting point may be mentioned. Ruschenberger writes the words *"Affino suo,"* instead of *"affini suo."* Morgagni would not have been likely to make a mistake, since the adjective *affinis* (better, *adfinis;* genitive, *affinis*) was often used as a substantive, indicating kinship of certain degrees, that could be jocularly made to cover such a similarity of names as occurred here.

With the available evidence there is no way of drawing a positive conclusion. The view that Morgagni wrote the inscription and that Rush quoted it seems not unwarranted. If some one who knew the blank page was gone invented the story and so misled Rush and the later writers, we have an early example of an American medical literary joker not unworthy of being classed with the genial Egerton Y. Davis; but if we admit this we may go a step farther and assume that the falsifier wrote the whole "Account." Whether this was really Rush, or some one else, seems impossible to prove.

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A BIOGRAPHY OF FRANÇOIS MAGENDIE.

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There are six principal sources of information with regard to Magendie's life and work.

(1) "Fr. Magendie. Leçon d'ouverture du cours de médecine du Collége de France. (29 février 1856.)" 8vo. *Paris*, 1856.

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This address was delivered by Claude Bernard and to it was appended an incomplete list of the writings of Magendie.

(2) "Éloge historique de François Magendie, suivi d'une discussion sur les titres respectifs de Bell et Magendie à la découverte des fonctions distinctes des racines des nerfs." 8vo. *Paris,* 1858. This "Éloge" was delivered at the annual public meeting of Académie des Sciences (Feb. 8, 1858) by Jean-Pierre-Marie Flourens, the permanent secretary of the Academy. Here also is given a list of Magendie's publications but it seems, however, to be only a copy of Bernard's list. The address was also printed in the *Gaz. méd. de Paris,* 1858, 3. s., xiii, 93-106. Both address and discussion were translated into English by C. A. Alexander and published in the annual *Report of the Smithsonian Institution,* 1866, 91-125.

(3) "Fr. Magendie" among the "Eloges lus dans les séances publiques de l'Académie de Médecine (1845-63)," by E. F. Dubois, the permanent secretary of the Academy. Two volumes of these addresses were published in Paris in 1864, that on Magendie being in vol. ii, pp. 116-200. The address was also printed in the following periodicals: *Gaz. des hôp.,* Paris, 1857, xxx, 590-92; *Gaz. méd. de Paris,* 1857, 3, s., xii, 793-814; *Mém. Acad. de méd.,* Paris, 1858, xxii, pp. i-xxxvi; and *Rev. thérap. méd.-chir.,* Paris, 1858, pp. 24, 53 and 77.

Eyriés (Biog. universelle (Michaud) ancienne et moderne, Paris, xxiv, 31) and L. Herman (La grande Encyclopédie, Paris, xxii, 994) seem to have derived their material from the three preceding sources for their articles contain no additional information.

(4) *Journal de physiol. expér. (et path.),* i-x, 1821-1830.

(5) *Comptes rendus hebdom. de l'Acad. des Sc.,* i-xlii, 1835-1856.

(6) The works of Magendie himself.

For convenience the following abbreviations have been adopted in the foot-notes of the following article:—

B = Éloge de Bernard (1).
C = *Comptes rend.,* etc. (5).
D = Éloge de Dubois (3).
F = " " Flourens (2).
J = *Jour. de physiol. expèr.,* etc. (4).

FIRST PERIOD. 1783-1809.

François Magendie was born on October 15, 1783, in Bordeaux.

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While he was yet an infant, his mother, Marie-Victoire de Peray-Delaunay, died of an acute illness. His father, Antoine Magendie[1] originally of Bearne, was a surgeon, who in 1792 came to Paris bringing with him the little François, then only nine years old.[2] At that time there was in Paris but one all-absorbing idea, one topic of conversation, namely, social regeneration; and Antoine Magendie was soon among the foremost of the ultra-republicans. "A man of upright purpose,[3] but incapable of allowing any folly to pass without taking his share in it, he imagined that, in order to endow his son with a civic energy corresponding to the elevation of his own principles, it was necessary to educate him according to the precepts delivered by Jean-Jacques.[4] The new Émile, left to his own devices, wandered at will, with a liberty which strongly resembled absolute abandonment. In order to preserve him from instructions which might warp his judgment, he was left, on principle of education, in complete ignorance. His only resource as regards the world of intelligence was observation, which alone, said his guide, could secure him entire *independence.*

"Finding, perhaps with reason, less difficulty in reforming abuses than in combating maladies, the enthusiastic patriot had abandoned a practice which only bored him, for the more congenial pursuit of unremunerative civic appointments.[5] With his practice went the comforts of the household, but what imported such a sacrifice as this? The exaggeration of patriotism and the reality of discomfort proceeded to such lengths that he would have constrained his pupil, while seeking to persuade him that this would be a further step towards independence, to make his own shoes. At this point the good sense of the boy revolted; he protested against all these follies: declared that he preferred to be de-

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[1] Born at Pontaque, died at Paris in 1813.

[2] It has been stated that Antoine Magendie married again and that the step-mother took but little interest in the young François. (*Med. Times and Gazette,* London, 1855, N. S., xi, 558 and 583.)

[3] Flourens. Unless otherwise stated the quotations in this chapter are from this authority (see Bibliography).

[4] Jean Jacques Rousseau: "Émile ou de l'Education," published in Paris and the Low Countries, 1662.

[5] Antoine Magendie was mayor of the tenth "arrondissement" and a member of the board of hospital administration, etc.—F., p. 134. The tenth "arrondissement" comprises the quarters Saint-Vincent de Paul, Porte-Saint-Denis, Porte-Saint-Martin and Hôpital-Saint-Louis.

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pendent and well-shod, and concluded by asking to be sent to school.

"The primary school had no pupil more ardent; admitted late and endowed with an energetic will, the young Magendie quickly outstripped all competitors. His father was not at all shocked at the inequality which his son found the means of establishing from the first;... and clapped his hands on hearing that the great prize had been awarded to this neophyte of fourteen for a composition 'On the Knowledge of the Rights of Man and of the Constitution.'[6]

"The *Journal des Hommes Libres*[7] soon afterwards announced 'that there was still hope for the most tender age, when the corrupting poisons of the reaction had not blighted it in its first bloom, since the son of citizen Magendie, municipal officer, elector, member of the commune, etc., having met with a child who was weeping and dared not appear in the presence of his father, had comforted, encouraged and carried him back to the bosom of his family.' A *prix de vertue,* ostentatiously awarded on this occasion, completed the glorification of the young republican...

"According to the almost universal practice of those who preach liberty, the father of Magendie reserved the exclusive use of it for himself. He announced to his son that in order not to derogate from the family dignity, he must prepare to invest himself with the robe and bonnet of the doctor." Accordingly Magendie began the study of medicine, entering the Paris hospitals at the age of fifteen.[8] Through his father's influence he became a pupil of Alexis Boyer,[9] who was at that time second surgeon to the Charité and professor of clinical surgery at the École de Santé, an institution founded in 1795 by the élite among the physicians and surgeons of the capital. Boyer soon perceived the young man's worth and made him his prosector. Later, at the examination which took place on "7 Floreal, An XI"[10] (1803), he obtained an appointment as hospital interne. In this new position he continued his labors with characteristic energy and zeal.

[6] "De la connaissance des droits de l'homme et de la constitution."

[7] 5 germinal, an VI.

[8] This is the age given by Eyriés: "Magendie" in "Biographie universelle (Michaud) ancienne et moderne," Paris, XXVI, p. 31. Sixteen years is the age given by the *Med. Times and Gazette,* loc. cit.

[9] Le baron Alexis Boyer (1757-1833).

[10] D: p. 122.

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FRANCOIS MAGENDIE, M.D.
1783-1855.

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With his medical studies he now combined literature, for since he had been taught none of the ancient languages he was desirous of supplying this deficiency. This he did by means of the excellent courses given by M. Lemare, which were attended by some of his most distinguished contemporaries.

The salons which the storm of the revolution had temporarily closed had now opened again. There "through the memory of a common calamity, all were friends" and there Magendie "was received as a young man of taste and worth, and there he dissembled with truly Roman stoicism, the distress of his situation. 'Yet,' as he himself would jocosely say in aftertimes, 'during a period which seemed no short one, there remained for me, all deductions made, not more than five sous a day to live upon; and still I had a dog. We shared with one another; and if he was not fat, neither was I.'"

In the course of time Magendie became assistant and then, after a brilliant examination, prosector to the Faculty. "His dexterity as an anatomist, his coolness, his hardihood, gave presage of a superior surgeon." "For a while he gave courses in operative surgery, which were well attended. He even devised a new operation for the resection of the lower jaw.[11]" "But the life of compulsory fellowship, of equality reduced to practice, the contact of rivalries never divested of the weapons of attack, proved an intolerable ordeal for his austere and imperious nature." It has also been stated that he was about to compete for the post of surgeon at the General Board of the Paris Hospitals but was induced to abandon the idea by Dupuytren[12] who considered him a dangerous rival.[13] However this may be, Magendie renounced his intention of becoming a surgeon.

He brooded with so melancholy a spirit over the obstacles before him that his retreat was invaded by that bitter discouragement which long suffering entails—Magendie wished to live no longer. One morning, however, a lawyer presented himself at the asylum of the student. "Why," cried the young man in surprise, "I have neither lawsuit nor business, what do you want

[11] B: p. 18.

[12] Baron Guillaume Dupuytren, born in 1777, became in 1803 second surgeon at the Hôtel-Dieu and in 1815 surgeon-in-chief. In 1811 he became professor of anatomy in the École de Médecine, an institution founded in 1795 for the purpose of training surgeons for the army.—Richeraud: Biog. univers. Michaud, xii, p. 60. Paris, 1855.

[13] *Med. Times and Gazette,* loc cit.

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with me?" "Nothing," replied the stranger, "that can be disagreeable to you. You have become heir to a sum of twenty thousand francs, and I am here to place it at your disposal." All at once the good spirits of Magendie returned; he "immediately made arrangements for the acquisition of pretty horses and attractive dogs, all placed in the care of a sprightly and fashionable groom, who was charged besides with the duty of keeping a light equipage always in readiness for the use of the improvident but joyous owner of these superfluities. That not a moment of this transient prosperity might be lost, and at the same time no encroachment upon his work be allowed, he had all of these paraphernalia lodged as near as possible to the hospital. 'Thither,' said M. Magendie afterwards, 'I used to run when I had a moment to spare, so that my whole recreation was literally centered in the stable.' The twenty thousand francs were, of course, soon spent, but a little relaxation does much good; it had renewed the elasticity of his spirit."

His money gone, Magendie found it necessary to become a practicing physician "in spite of himself." [14] In 1808 he received his doctorate, his inaugural dissertation being on fracture of the cartilage of the ribs and on the movements of the palate (1) Doubtless a rather unique figure among the physicians of his or indeed of any time, he refused to bow before what he called the "the great idol of human credulity."[15] But as yet Magendie's notions had little weight in the medical world and moreover he soon gave himself almost entirely to the science of his choice, experimental physiology.

SECOND PERIOD. 1808-1821.

VITALISM.

The question, What is life? has been answered in two different ways. "On the one hand [16] stand the vitalists, who see in the phenomena of life only special actions, having no relation to the usual laws of chemistry and physics but accomplished through a peculiar force called life, vital force and so forth: on the other are the materialists, iatro-mechanicians, or chemists as they have been variously styled, who see in these manifestations of life nothing but the phenomena of ordinary chemistry and physics

[14] F: p. 11.

[15] "La grande idole de la crédulité humaine."

[16] B: p. 3 *et seq.*

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subject to the ordinary laws which govern these phenomena outside the organism.

"In France at the beginning of the nineteenth century medicine and physiology were dominated by the anatomico-vitalistic ideas of Bichat which were then reacting against the iatro-mechanical and chemical theories of Borelli, Sylvius de la Boe, Boerhaave and others." Bichat, "a man of astonishing genius, physiologist-anatomist *par excellence,* created general anatomy and at the same stroke anatomical physiology.... In his 'General Anatomy'[17] he tried to realize a vast conception which consisted in reducing, just as in the recently established field of chemistry, anatomical tissues and physiological phenomena to certain simple elements." He attributed "all the functions of life to those peculiar properties of each living tissue, which he designated under the name of vital properties, as distinct from physical or chemical properties... 'There are in nature,'[18] said he, 'two classes of objects, two classes of properties. The objects are organic and inorganic, the properties are vital and non-vital. Sensibility, contractibility, these are vital properties. Weight, elasticity, affinity, these are non-vital properties.' To each of the systems of anatomical tissues correspond certain definite vital properties, and each phenomenon of life has necessarily, as its origin, a vital property which is only the functional manifestation of the tissues..."

"Such a generalization in which everything was united by logical deduction, anatomical structure and vital property, physiological and pathological phenomena, was well calculated to seduce and enthral all minds...But Bichat died," in 1802, "having hardly had time to deliver to posterity the fruits of his genius, and his immediate successors, launched on this slippery declivity of anatomical deduction, contented themselves with their creations of systems; and experimentation, which can alone permit us to decide the question and prevent us from error, was lost to view. Not only the system of exhaling vessels, the vital properties of sensible, organic and animal contractility and so forth were accepted as realities, but the imagination, always aided by some sort of logic the better to captivate the reason, had invented a horde of other properties still more imaginary. Finally everyone wished to have a special vital force for the least phenomenon

[17] Anatomie générale, applique à la physiologie et à la médecine. *Paris,* 1802, 2v. 8vo.

[18] B: pp. 5-6.

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of the organism, and by this tendency all physicians were blindly carried away."

Such was the condition of physiology in France when in 1809 Magendie's first publication appeared, under the title of "Some general ideas upon the phenomena peculiar to living bodies" (2). Cool, unenthusiastic, skeptical, Magendie was not drawn into the common whirlpool, and this first publication was a severe criticism of the "vital properties" of Bichat, "especially the strange abuses which his successors had made of them in multiplying them *ad infinitum*. 'Why then,' said he, 'is it necessary in respect to every phenomenon of the living body to invent a peculiar and special vital force? Cannot one be content with a single force which one could designate *vital force* in a general way, while admitting that it gives rise to different phenomena depending on the structure of the organs and tissues which function under its influence? But is not this single vital force still too much? Is it not an hypothesis pure and simple, inasmuch as we are unable to perceive it? And would it not be more advantageous if physiology began only when the phenomena of the living body became appreciable to the senses?' "[19]

Surrounded by a carnival of rampant speculation, Magendie developed an extraordinary repulsion for all theories. When any one spoke to him of medical doctrine or theory, he showed instinctively a feeling of horror. It produced upon him the effect of a false note upon the trained ear of a musician. His reply was always the same. "All that," he used to say, "is nothing but words!"—"To express an opinion, to believe," wrote Magendie, "is nothing else than to be ignorant... One could with justice say to you 'You believe, therefore you don't know.' "[20]

EARLY WRITINGS.

Magendie now began to show a prodigious activity. Within the next five years he published seven memoirs, four of which were read before the Academy. In these the author dealt with a great variety of topics. In his study of the organs of absorption in the mammalia (3) he demonstrated by means of a series of ingenious experiments the power of the veins to absorb poisons injected into the tissues. He showed that the stomach was not necessary for the act of vomiting (6) and that swallowing might

[19] B: pp. 7-8.
[20] J.

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take place without the aid of the epiglottis (9). The remaining memoirs were on pulmonary transpiration (5), on examination of images in the fundus oculi (7), on emetics (8), and on the function of the œsophagus (10).

Consequently, when in 1814 Magendie, who had been twice designated by the conscription, was again summoned, the Academy interposed in view of his prospective services and requested his exemption. This was accordingly granted by a special decree dated March 5th of that year. "You owe this favour," wrote M. de Motalivet, Minister of the Interior, "to the success which you have achieved in the sciences, and I doubt not that you will redouble your efforts to render yourself more and more worthy of it."[21] Magendie soon showed that the confidence of the Academy had not been misplaced.

Before 1821, the year in which he became an academician, Magendie published nine more monographs. In one of these (13) he showed the necessity of the presence of nitrogen in the food and emphasized the importance of a varied diet. From his study of the circulation (16), he concluded that those persons are in error who affirm that the arteries possess the power of independent rhythmic contractility.

The monographs on the deglutition of air (12) and on the mechanism of absorption in the mammalia (24) were among those read before the Academy. There was also a paper on the lymphatics of birds (21) and another on the gases in the human intestine (14). In the investigation of ipecacuanha (15) which Magendie carried out in company with Pelletier, emetin, the active principle of the drug, was discovered, and his interest in pharmacological problems was further shown by three other memoirs on strychnia (22), on the salts of morphia (18) and on hydrocyanic acid in the treatment of phthisis (20). During this period Magendie also published three books through which he soon obtained an international reputation.

The first of these was his "Text-book of Physiology" (11), a work which appeared in two octavo volumes, containing so much good sense and sound science that even to-day they are found attractive reading. The attitude of the author and the object which he had in view may be gathered from the preface, some passages of which run somewhat as follows:[22]

[21] D: p. 125.

[22] Précis élémentaire de physiologie. Paris, 1816. Vol. I, p. ii *et seq.*

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"The physical sciences, with scarcely a single exception, were systematic until the time of Galileo and Bacon. From that period, and in a great degree from the influence of the writings of the illustrious Bacon, they have undergone a most salutary change. From being systematic and synthetic, they have become theoretic and analytic; and from that period their march towards perfection has been extremely rapid.

"It is unpleasant but it is at the same time necessary to remark that in the midst of this general progress of the sciences, physiology, that important branch of human learning, still retains its systematic form." "What is the consequence of all this? —It is that physiology, brilliant as it appears in our modern treatises and notwithstanding the improvements which it has derived from the talents of many distinguished men, is a science still in its cradle."

Further on he continues: "One will especially find in this book facts, the truth of which I have done all in my power to establish as definitely as possible, by observations upon man in a healthy or morbid state, and by experiments upon living animals."

"In concluding it is proper to remark that this book is solely designed for students of medicine. If they find here, in terms clear and simple, all which is positively known of physiology, I shall have accomplished the object which I have proposed to myself."

This work was deservedly popular. Between 1817 and 1836 it went through four editions in Paris. Between 1822 and 1844 there appeared three American editions; while two German translations were published in Tübingen in 1826 and 1836, respectively.

The second book, published in 1818, was the first edition of his work on "Gravel and Its Treatment" (17). This was subsequently translated into German and Dutch. In it Magendie called attention to the fact that most gravels and many stones are composed of uric acid, a substance rich in nitrogen, whence he concludes that a diet poor in nitrogen is the proper one for persons suffering from these maladies.

Lastly may be mentioned the publication two years later of the famous "Formulary" (23), in which he discussed the action and preparation of a large number of drugs which were at that time new or almost new to the profession. Among these were

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strychnia, morphia, iodine, potassium iodide, prussic acid, veratria, sulphate of quinine, croton oil, and so forth. The popularity of this work is attested by the many translations and editions which have appeared, namely: Paris, 7 editions; Amsterdam, 1; Leipzig, 1; London, 3; Philadelphia, 2; and New York, 2.

THE PRIZE IN EXPERIMENTAL PHYSIOLOGY.

Meanwhile Magendie's intense aversion to all hypotheses, together with his devotion to the experimental method, seems to have won for him the friendship of the great Laplace.[23] The latter "wished that all science should consist of nothing more than an assemblage of facts rigorously concatenated; and having, according to the happy expression of Cuvier, *'subjected the heavens to geometry,'* he probably did not despair of establishing the same order of things on earth."[24] Indeed, Laplace had maintained before the Academy that the two sciences most worthy of the attention of great minds were physiology and astronomy, and added, "If I put physiology in the first place, it is not only because it still awaits its Newton."[25] Magendie, "confident in his own strength, held himself aloof with a disdainful pride" from his contemporaries. "But one day the illustrious, the stiff, the judicious Marquis de Laplace volunteered the first advances toward him," and at the few words of encouragement which fell from the lips of this great man, Magendie, "who thought himself secure from all enthusiasm, was only the more carried away by it."

"It was not long after this that Laplace said to his old friend Montyon:[26] 'It is greatly to be regretted that learned societies have not at their disposal the means of sustaining the zeal of enquirers who have established themselves in the right method of procedure: the young Magendie, for instance, who gives to his physiological labors, the invariable basis of experiment, would deserve to be encouraged.' 'Are not your own exhortations the most powerful encouragements?' was the reply. 'They are not

[23] Pierre Simon, Marquis de Laplace, 1749-1827. Became professor of mathematics at the military school in Paris, and in 1773 member of the Academy of Sciences. Best known as an astronomer and geometrician.

[24] F: p. 21.

[25] Dedication of "Recherches sur les ossements fossiles."

[26] Antoine-Jean-Baptiste-Robert-Augat de Montyon, 1733-1820, became councillor of state in 1775. He lived for many years in England and became a member of the Royal Society. He was devoted to the king, with whom he returned to Paris.

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sufficient,' answered Laplace, 'for those who aspire to reach our academies there should be graduated approaches, which would consist of competitions and prizes.' The prize for experimental physiology was thereupon established [27] by the aged philanthropist and Magendie was the first to be distinguished by it." [28]

(*To be continued.*)

THE ANTAGONISM OF THE CHURCH TO SCIENTIFIC PROGRESS DURING THE MIDDLE AGES: THE FACTS OF THE CASE, AND A REPLY TO THE CRITICISM OF DR. JAMES J. WALSH.

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THE article from the pen of Dr. James J. Walsh, entitled "Pope John XXII and the Supposed Bull Forbidding Chemistry" which appeared in the October, 1905, number of the Medical Library and Historical Journal* will be seen to have been written in criticism of a short address which was made by myself when introducing Dr. Joseph L. Mayer, Assistant Professor of Chemistry at the College of Pharmacy, to the Men's League of St. Peter's Protestant Episcopal Church, before whom Dr. Mayer was about to lecture on a chemical subject.

In introducing a chemist to a Church audience one would naturally refer, to some extent at least, to the historical relations of the science of chemistry to religious orthodoxy; and, incidentally, without intentional offense, the previous relations of the Church to other branches of science might reasonably be mentioned by the speaker. Having followed this suggestion on the occasion referred to, I find that Dr. Walsh, with the Christian spirit together with the desire for truth which characterized for hundreds of years the methods of the Romish (as well as the Protestant) Church in its dealings with scientific problems, has vigorously attacked the accuracy of my assertions. Not only am I publicly charged by Dr. Walsh with general ignorance concerning the

[27] This foundation received the authorization of the king, July 22, 1818.

[28] F: p. 28.

* 1905, iii, pp. 248-263.

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subject of my remarks, as a reference to his article will show, but I am specifically indicted by him for having made, regarding science and education in the Pre-Reformation period, a number of false statements. Therefore, I stand to-day accused by him of the rankest historical heresy. And, worst of all, the penance which he imposes on me for having committed these indiscretions is that I am invited by him to listen to a course of lectures on the History of the Middle Ages which he, at the time of his writing, intended to deliver at the Brooklyn Institute of Arts and Sciences. Alas, my punishment, at his hands, is greater than I can bear. Let him place my printed address on the *Index* if he will. Let him punish my crime with condemnation resulting in the penalty which the Mother Church inflicted on John Huss, and also on Bruno; sentence me as did Calvin the much lamented Servetus; persecute, torture and imprison me as was the immortal Galileo persecuted, tortured and imprisoned; hound, distress and harass me as were Copernicus, Roger Bacon, Descartes, Kepler, Newton, Linnaeus, Buffon, Cuvier, Geoffrey Saint-Hilaire and all the long array of martyrs to the cause of science were hunted, distressed and harassed by the ecclesiasticism of their day. Let me feel the pain which was inflicted by the thumbscrew, lash, and rack of the Holy Inquisition. Bid me endure the agonies of chain and dungeon, the true emblems of Christian orthodoxy during the much boasted Middle Ages; compel me if needs be to dwell in the ignorant and superstitious atmosphere of orthodox Protestantism which characterized its theologic history from Luther to the burning of the Salem witches; bid me endure all this and I will cheerfully obey, but I must implore Dr. Walsh, with all due respect to him personally, if his article stands as a fair sample of his teaching, that he will not insist on my accepting his invitation to attend his evasive and one-sided lectures on medieval history. I pray him to be merciful, even as he expects mercy; I beg of him not to decree that the suffering shall be so long drawn; even the thought of such infliction is painful. May I be permitted to assure Dr. Walsh that when I made the address which has given his historic learning such a shock I was not aware that Andrew D. White, John W. Draper, Ernst Hæckel, F. V. N. Painter, Thomas H. Huxley, Sprengel, Von Ranke, Henry C. Lea, Hanson, together with innumerable other writers, had been misleaders in their various contributions to the history of the Middle Ages. I did not know that they were, every one of them,

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ignorant falsifiers. Previously to having read his article I had no means of knowing that Dr. Walsh disagreed in much of his interpretation of the history of Papal and Protestant Christianity with the most intelligent and impartial thought of modern times; neither did I know that he was of counsel for the defense; his fame as an advocate had not yet reached my ears. Even after I had carefully read his brief I was still sufficiently skeptical to doubt the implications contained in it, namely, that nearly all of the writers of religious and scientific history of the Middle Ages, except Dr. Walsh, have distorted the real facts. It was this doubt that led me to mail a copy of the JOURNAL containing his article, together with a copy of the July number, which contains my own address, to the renowned historian and scholar, Andrew D. White, with the request that he would express his opinion with regard to the truth concerning the history of Pope John XXII. The following is Dr. White's reply:

ITHACA, N. Y., February 24, 1906.

DR. W. J. CRUIKSHANK:

My Dear Sir:

Pardon my delay in writing you on the subject referred to in your letter of January 24. Until receiving this letter from you, I had never heard of the articles you sent me in the MEDICAL LIBRARY AND HISTORICAL JOURNAL, and have hardly had leisure to do more than glance at them since that time. Having been very busy, my correspondence has fallen sadly into arrears. It is only during the present week that I have been able to take up with any care the subject to which you have called my attention, namely, the article on "Pope John XXII.," by Dr. James J. Walsh, Professor of the History of Medicine, at Fordham University.

Allow me to say, first of all, that I have rarely found, even among the utterances of the most unreasoning controversialists, an assertion which seems to me so defiant of fact as his (page 260) "that there is not a single statement of Dr. Cruikshank that has a basis in historical truth." For, not only is there a historical basis for every leading statement of your article, but, though you make the lights and shadows somewhat strong, your whole contention seems to me in strictest accord with historical truth as recognized by the writings of unbiased modern scholars.

True, I differ with you somewhat in my estimate of the general influence of the Church and its theology in the Middle Ages.

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An organization which produced the medieval cathedrals and the scholastic philosophy, superseded though the latter may now have become, was certainly not deficient in strong men and in earnest thought. But, while thus differing with you, I reiterate my conviction that your statements of fact, as regards the influence of dogmatic theology on science, are based on sound historical authority, Catholic as well as Protestant, and, what is better, upon documentary evidence, impossible to gainsay.

Perhaps the easiest way is to take up Dr. Walsh's reply to you as it runs. Incidentally, on page 249, before he gets fairly into his subject, which is, mainly, Pope John XXII., he takes up the Decretal of Boniface VIII., in 1300, and endeavors to show that, so far from forbidding dissection, it had quite a different tenor, and that at sundry universities in Italy and at the University at Montpellier, in France, dissection was permitted and most openly practiced. This seems to me very disingenuous.' The Decretal of Boniface was construed universally as prohibiting dissections for any purpose whatever, as may be easily seen in the Benedictine *Histoire Littéraire de la France* and other sources, Catholic as well as Protestant. The rise of the medical school of Montpellier was due, almost entirely, to Jewish physicians, and the influence of the Church authorities there, as well as in all European universities, was, for many generations, steadily thrown against dissection.

The simple facts in the case are as follows. The Decretal issued by Pope Boniface forbade a practice which had come into use during the Crusades, namely, the separation of the flesh from the bones of the dead, whose remains it was desired to carry back to their own country, but it seems strange that Pope Boniface, if he was really an infallible teacher in all that pertains to faith and morals, should not have been allowed to foresee the fact that this Decretal was to do more to keep up ancient and unfortunate prejudices against dissection for anatomical purposes, than any other thing done during the Middle Ages. More than anything else, it operated to perpetuate, in the controlling ecclesiastical mind of all Europe, the idea that there was, in dissection of the human body, something sacrilegious, and no one thing did so much to retard both anatomy and surgery.*

* See citations from such eminent authorities, Catholic and Protestant, as Sprengel, Frédault, Roth, and many others, as given in my "History of the Warfare of Science and Theology," Vol. II, pp. 32, also 51 and 53, and Note.

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And, now, as to Dr. Walsh's statement that dissection was permitted by Popes and ecclesiastical authorities in universities. His argument in the matter is an excellent example of Jesuitism. It is true that under the pressure of the developing science of medicine, sundry civil and ecclesiastical authorities did, from time to time, issue permits allowing an occasional dissection, at rare intervals, here and there, as, for example, the permission given to the University of Lerida, in 1391, to dissect one dead criminal every three years, and to sundry other universities to dissect one or two human bodies each year. It is a fact for which we have ample testimony, that Mundinus, the great anatomist preceding Vesalius, only dissected three human bodies with his classes during his entire career. So far from effectually helping anatomy, these permissions served really to fasten the idea upon the European mind that dissection to any considerable extent by anatomical investigators, ought not to be allowed, and, as a matter of fact, it was not until Vesalius, in spite of theological opposition, braved calumny, persecution, and, possibly, death, that this ecclesiastical barrier to investigation was broken through. Even as late as the last year of the eighteenth century, there were no dissections before the medical classes of the Spanish universities, theological control being, in these, supreme.*

But Dr. Walsh elsewhere falls back on the fact that, shortly after the Bull of Pope Boniface VIII., which struck so severe a blow at dissection, the Venetian Senate passed a decree ordaining that a dissection of the human body should be made every year in the City of Venice, and he leaves his readers to conclude that this effectually proves that dissection had not really been discouraged by the Pope. The very opposite conclusion would be deduced by any one familiar with the relations between the Republic of Venice and the Papacy. These two powers were always struggling against each other; again and again the Venetian Republic, in maintaining its rights, braved papal interdicts. The authorities of the Republic allowed its citizens to have full commercial relations with heretical powers, permitting Protestant worship in Venice to the adherents of various Protestant churches, insisted on punishing clerical malefactors and limiting the number of clerical foundations for monasteries, and the like, and in these and in many other ways, constantly, century after century, defied the whole

* See authorities cited in my "Warfare of Science," as above, Vol. II, pp. 50-55.

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might of the Vatican. The fact that it allowed dissections, so far from proving that the Pope allowed them, would seem, to any one acquainted with the spirit of Venetian history, to prove that in this case, as in so many cases and especially in that of Vesalius, at Padua, the Venetian Republic sought to show the Vatican that it would yield none of its rights to clerical control. This very fact—that Venice refused to be bound, as regards anatomical investigation, by an order from the Vatican—seems to be entirely in the line of all the other facts in the case which show that the Roman Court had committed itself most unfortunately against the main means of progress in anatomy and medicine.

As regards these facts, there is a perfect consensus of all important medical authorities, except, perhaps, those like Dr. Walsh, Professor of the History of Medicine in a Jesuit College, who seems to hold a brief which obliges him to put a construction upon all historical facts such as he supposes the interest of the Church to require.

I now take up Dr. Walsh's main effort in his article, his glorification of Pope John XXII. To start with, I need hardly say that Pope John does not pass among historians for the sort of man whom Dr. Walsh feels it his duty to make him out to be. If not one of the worst popes, like Sixtus IV., or Alexander VI., he was, so far as we know him, a whole intellectual and moral heaven below such popes as Benedict XIV. and Leo XIII. It is not hard, indeed, to learn where Dr. Walsh has gained his idea of him. The Doctor has simply turned to the well-known ultramontane cyclopædia by Wetzer and Welte, recast, in that second and later edition which he has used, by scholars under the lead of Cardinal Hergenrother, and notorious among liberal Catholics for its reactionary tone and proselyting purposes. So carelessly has Dr. Walsh borrowed from this book, that, in citing as evidence for the Pope's patronage of letters the two volumes on the papal library contributed by a French scholar, Faucon, to the great serial French official collection of the work done in the schools of research maintained by the French government at Athens and Rome (the *Bibliothéque des Ecoles française d'Athènes et de Rome*), he calls this well-known work, which he apparently knows only through his encyclopædia, "Faucon's article . . . in his collection of 'Studies of the Libraries of French Schools and also of Athens and Rome.'" The author of the cyclopædic article would hardly recognize so distorted a reference.

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For what can be justly said against Pope John XXII., one will hardly turn to such a source. "Later on," says Dr. Walsh, "when Petrarch was there," the papal city, "Avignon, became a distinguished literary centre." Now, according to Petrarch's own account of the matter, which the world has hitherto accepted, it was precisely during the pontificate of Pope John XXII., that Avignon was Petrarch's home, and it is a pity that Dr. Walsh has not quoted the testimony of so competent a contemporary, regarding that capital as a city of learning and of virtue. Another contemporary, the Florentine John Villani, could tell us something of Pope John's reputation for generosity; and on the results of his financial skill one may turn to the unimpeachable testimony of the Pope's own penitentiary and friend, the Spanish Franciscan, Alvaro Pelayo, whose huge book on the moans of the Church, *"Planctus Ecclesiae,"* was written during John's reign. Or Dr. Walsh might have given us the testimony of Ludwig Pastor, the eminent professor of history in the Roman Catholic University of Innspruck, the latest and greatest Catholic historian of the papacy, who says "especially from the time of John XXII. the unwholesome system of annates, reservations and expectancies reached its full development. It brought in its train an army of abuses." And Pastor quotes the severe verdict of Pelayo, "whose testimony," he says, "is so much the more important because, having lived for many years as an official at the court, he paints conditions at Avignon from his own personal observation."*

Non-Catholic historians dare to speak more bluntly. "There have been few Popes," says the most eminent and the most scrupulously accurate of living American medievalists, whom all the world recognizes as an authority, Mr. Henry C. Lea, "who have so completely embodied the ruling tendencies of their time, and few who have exerted so large an influence on the Church, for good or evil. . .His chief characteristics were ambition and avarice . . . As for the latter, his quenchless greed displayed an exhaustless fertility of resources in converting the treasures of salvation into current coin. He it was who first reduced to a system the 'Taxes of the Penitentiary,' which offered absolution at fixed prices for every possible form of human wickedness." And this is but the beginning of Mr. Lea's indictment. Read for yourself the whole instructive passage, pp. 66-69, of the third volume

* *See:* Pastor, *Geschichte der Päpste,* Vol. I, p. 63.

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of his "History of the Inquisition of the Middle Ages." Or note the words of Charles Molinier, one of the most eminent French historians of our time, who has had much to do with Pope John in his studies of the inquisition in Southern France: "Greediness for gain, tenacity in rancor, rigor pushed to cruelty, gross superstition, these were his principal traits." (*Annales du Midi,* July, 1904, p. 364.)

But, perhaps, it is better to allow Pope John XXII. to be judged out of his own mouth. Dr. Walsh quotes from his bull issued in 1713, and speaks of John XXII. as if he were an eminent chemist, trying to protect the world against the humbugging alchemists. But, as everybody knows, there was then no chemistry except alchemy, and, had John XXII. dabbled in that study at all, he too would have been an alchemist. In point of fact, there is not the slightest tenable ground for ascribing to John any acquaintance with that study. It is true that in 1557, more than two hundred years after his death, there was fathered upon him by some sixteenth-century printer a treatise on the art of transmuting metals; but on what great name of the earlier days were not such books fathered? What name could be more tempting for such an ascription than that of the Pope who, of all, was most notorious for the hoard he left behind? What name more reassuring to the piously hesitant buyer of the book than that of the Pope who had forbidden the frauds of the alchemists? And how good a joke such an ascription in the eyes of the free-thinking sixteenth-century printer! Just glance over a list of such books in alchemy or magic and see to whom they did not dare to ascribe them. And, so far as I have learned, no serious scholar has ever taken the ascription seriously. Even the old French biographical dictionary which Dr. Walsh cites says only that it was published under John's name,—distinctly implying that it does not think it his. In the standard modern French cyclopædia, the *Grande Encyclopédie,* Dr. Walsh, if he looked, found no mention of the book at all. Nor did he find any in that modern biography of Pope John in the German Catholic cyclopædia of Wetzer and Welte, from which his article is so largely drawn.

But to return to the bull. Dr. Walsh, has, indeed, correctly printed it, and I notice no flaw in his translation. Pope John, of course, justified his measures, by painting the alchemist as black as possible. But, if you would know what, in the opinion

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of those who have studied the subject, was the effect of the bull upon chemical research, turn to any of the standard historians of chemistry. I have but followed what I found their unanimous opinion.

It is a pity that Dr. Walsh does not quote in full Pope John's other and much more interesting bull,—*super illius specula*—of 1326. One would suppose from the Doctor's account that this pontiff was a kindly and rational scholar seeking to save the people from the clutch of superstition. This bull of 1326 shows Pope John himself, in spite of his infallibility, sunk in superstition the most abject and debasing; for, in this bull, supposed to be inspired from wisdom from on high, Pope John complains that both he and his flock are in danger of their lives by the arts of the sorcerers. He declares that such sorcerers can shut up devils in mirrors, finger-rings and phials, and kill men and women by a magic word, that they had tried to kill him by piercing a waxen image of him with needles, in the name of the devil. He, therefore, not only in this bull, but in brief after brief, urged bishops, inquisitors and other authorities, sacred and secular, to hunt down the miscreants who thus afflicted the faithful, and he especially increased the power of the inquisitors in various parts of Europe, for this purpose. This bull it was, and others to the same purpose, which stimulated that childish fear and hatred against the investigation of nature which was felt for centuries and which caused chemistry to be known more and more as one of the "seven devilish arts." This was the teaching which bloomed in the bulls and other declarations against the pretended crime of witchcraft, issued by Pope Eugene IV. and Pope Innocent VIII., in the fifteenth century, by Pope Julius II. and Adrian VI., in the sixteenth century, and by a multitude of other most eminent authorities, Catholic and Protestant, for many generations afterward.

Dr. Walsh then proceeds to give us another beautiful example of the Jesuitical method. In order to show that Pope John's decree did not "deter people from too ardent investigation of nature's secrets," he goes on to speak of certain leading scientific investigators in the Middle Ages, among these Albert the Great, at the University of Paris, Roger Bacon, at the University of Oxford, Raymond Lully and Arnold Villanova, and claims that they were more or less theologians, as well as scientists, and that the ecclesiastical power of the time permitted or even favored them. Now, as a simple matter of fact, to be ascertained from all the

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leading historians of chemistry and physics, every one of these men was thwarted or hampered by ecclesiastical surroundings or theological prejudice. There was not one of them who had not the greatest reason to complain of limitations to his scientific work in the supposed interest of religion. Take, as one example, the fact that Pope Alexander III., in connection with the Council of Tours, forbade the study of physics to ecclesiastics. What the Pope thus expressly forbade was, in the words of the papal bull, "the study of physics, or the laws of the world," and the bull added that any person violating this rule, "shall be avoided by all and excommunicated." *

Having thus, by the aid of his ultramontane encyclopædia, made out of John XXII. one of the great Popes, Dr. Walsh seems encouraged to take even higher flights, for he next discusses the *Bull Summis Desiderantes,* issued by Pope Innocent VIII., in 1484, and, taking advantage of the slip of your pen by which the period from the middle of the fifteenth century to the middle of the sixteenth is named, instead of the period extending from the middle of the sixteenth to the seventeenth, as the great age of witchcraft in Germany, he attempts to avoid the fact that this document, supposed by the Universal Church to be infallible, exhorted the faithful to root out witchcraft and was one of the main agencies which caused the death of uncounted thousands of men, women and children for this imaginary crime in a single century in Germany alone, and also had a vast effect in Italy and Spain.

Dr. Walsh cannot deny that this bull set forth at much length and in hideous detail the alleged fact that, throughout Germany, men and women, under a compact with Satan, were reveling in the most frightful orgies of witchcraft, that it empowered the inquisitors to proceed in spite of the opposition of those who, to use the words of the bull, "think of themselves more highly than they ought to think." He cannot deny that the bull gave the inquisitors the full authority of the Church, that it instructed the Bishop of Strasburg to put down by force all who might attempt to hinder them, and that it authorized the inquisitors to use, where necessary, excommunication and interdict and to call in the help of the state. Nor can Dr. Walsh deny that this bull caused the shedding of seas of inno-

* For the Bull of Alexander III. see the *Acta Consiliorum, Ed. Hardouin, Tom. VI, pars. II,* p. 1598.

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cent blood. But, by a piece of rather unskilful evasion, he proceeds to assert that there are vastly more records of persecution for witchcraft, during the period following the Reformation, in Protestant than in Catholic countries, and (most amazing statement of a "Professor of History!") he declares "it is probably in England, the century after the English had broken away from their allegiance to the Roman pontiffs, that the most persecutions for witchcraft took place and that the most legal executions for this supposed crime were carried out."*

Now, no authority of importance, whether Catholic or Protestant, denies the monstrous part taken in the witchcraft persecutions by the Protestant Church, especially in Germany. No honest and thoughtful Protestant denies for a moment that this Protestant persecution was, if possible more inexcusable than the Catholic. No sane Protestant feels that he holds a brief for his Church which obliges him to defend it from the charge of fearful and cruel error in this matter. But, as to Dr. Walsh's assertions that there were vastly more records of persecutions in Protestant than in Catholic countries, two things may be noted, first, that the most frightful centres of witchcraft persecution in the German Empire, in the sixteenth and seventeenth centuries, were at the very headquarters of Catholic power in that Empire, and, above all, at Trier and at Salzburg, under the control of their Archbishops, and at Bamberg and at Wurtzburg, under control of their respective Bishops. The courts of these four districts, ruled by Bishops who were, at the same time, temporal princes, were simply shambles. The annals are frightful, and it is worthy of note that the persecutions lingered in such clerically-governed states to a greater extent and longer than anywhere else,—notably at Salzburg, where, in 1679, ninety-seven persons were sent to the scaffold for this imaginary crime, and at Wurtzburg, where the last of the important executions in Germany took place, that of Maria Renata, sub-prioress of a convent near that city, in 1749.

Dr. Walsh's statement regarding England is equally un-

* As to the *Bull Summis Desiderantes,* see not only the bull itself, but, especially, the foremost authorities, like Hansen, Soldan, Riesler, Hinschius and others, authorities whom no historical scholar worthy of the name will gainsay.

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historic. It is absurdly untrue, as every historian will acknowledge, that the most persecutions for witchcraft just after the Reformation took place in England. Prior to the accession of King James, in 1603, witch-trials were hardly known there; and, even under the statute inspired by his Scotch orthodoxy, at his coming to the throne, though there were a certain number of trials, just as there occurred sporadic witchcraft persecutions in New England at a somewhat later period,—and bad enough they were—they were as nothing in number, compared to those which took place on the Continent. And the reason is very simple; it was not because Englishmen were personally more merciful than other people, but simply because torture, as a means of detecting crime, was not favored by English law, and had always been discouraged, and as a rule, very rarely allowed, save during parts of the Tudor and Stuart periods. This being the case, there was little possibility of doing what in many other countries was so common, and, above all, in Catholic and Protestant Germany, namely, taking women and children and torturing them excruciatingly, until, in order to obtain relief by death, they confessed to anything and everything which they thought would cause their persecutors to put an end to the frightful agonies of the torture-room and send them to execution. It was under such pressure as this, in the ecclesiastical centres of Germany, both Catholic and Protestant, that men, women and children confessed to riding on broomsticks with Satan to the Blocksberg, and women, and even children of tender years, confessed to bearing children to Satan.

The next assertion of Dr. Walsh is astounding, and can only be accounted for by the fact that his encyclopædia has misled him. He says: "No Catholic country in Europe had anything like the awful disgrace of Protestant countries in this matter. Spain, for instance, escaped comparatively free." I have no desire to conceal or attenuate the part taken by leading Protestants in preaching witchcraft doctrines—from Martin Luther to John Wesley—but it is clear that as to the simple historical truth in this matter Dr. Walsh has not taken the trouble to consult any real authority such as a man, not holding a brief and mainly desirous of stating the truth, would at once refer to. Dr. Menendez-Pelayo, Professor in the University of Madrid, and an ardent Catholic, gives at great length, in his *Historia de los Heterodoxos*

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Españoles, accounts of proceedings against witches in Spain. (See the work cited Vol. II, pp. 646 *et seq.*) The north of Spain especially distinguished itself by witchcraft persecutions until into the seventeenth century. At a witch-trial in Logroño, in 1610, fifty-three people were sentenced to various cruel punishments, many of them to death. At Seville, a witch was burned as late as 1781, and even in the nineteenth century the Spanish Inquisition imprisoned people for witchcraft. (See Soldan, *Geschichte der Hexenprocessen*, Vol. II, pp. 314, 315.)

Hansen, the highest German authority on the history of the witch-persecution, at the present time, a scholar who has been recently quoted with respect by a scholarly Catholic controversialist, shows by citations from Spanish Catholic authorities that the special tribunal established by the Inquisition in Spain was exceedingly severe, citing Spanish authorities for his statements. (See Hansen, *Quellen und Untersuchungen*, etc., p. 238-239.) Rodrigo in his ultra-Catholic *Historia Verdadera de la Inquisicion*, shows that the Spanish Inquisition went into persecutions for witchcraft earnestly and fully. (See work cited, Tom. II, Chapter XXXIX.) Eminent Spanish theologians were especially prolific in treatises showing the enormities of witchcraft. Among these were Eymeric, Basin, Castro, Torreblanca, and, most eminent of all, Del Rio, of the Society of Jesus.

As regards Italy, too, Dr. Walsh's statement shows amusingly the limitations of the cyclopædia. It is true that in the Italian valleys of the Alps the witch-persecution raged with especial fierceness; but there is one great difficulty about Dr. Walsh's explanation that this was because the Italians there were most in contact with German Protestants, and that difficulty is that no Protestants then existed: these persecutions antedate the Reformation. The inquisitors who supplemented Pope Innocent's witch-bull of 1484 with that terrible handbook of rules for witch-persecution, the *Malleus Maleficarum*, drew their illustrations most largely from the persecution then raging in the Italian diocese of Como. But Dr. Walsh may find a careful and frank account of that whole pre-Reformation episode in a more accessible book,—in the admirable history of the diocese of Como, by an eminent Catholic historian of our own days, Cesare Cantu. In my own collection is the autograph manuscript of one of those pre-Reformation Italian witch-hunters—the Lombard Inquisitor, Visconti—a manu-

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script treatise in which he is at pains to prove that the witches are not by any means crazed old women, but culpable heretics, and as such should be dealt with by the Inquisition.

There is another difficulty, too, about Dr. Walsh's explanation of the Protestant origin of the Italian witch-persecution, and that is that the German neighbors of the Italians, the Swiss and Tyrolese mountaineers, happen to have been always the most ardent of Catholics, as they are to this day. And why, after all, should any Italian need to be taught persecution by Protestants when, so early as the 28th of June, 1421, more than sixty years before Luther was born, St. Bernardino of Siena, the greatest Italian saint and preacher of his age, capped his great public conflagration of the vanities, at Rome itself, the capital of the faith, by burning the witch Finicella,—" and all Rome," as Infessura adds, "was there to see." (See his Diary, in *Muratori,* Vol. 3, pt. 2, p. 1123.) And surely Dr. Walsh will not credit to Protestant influence, despite the lateness of the date, that horrible affair of the *Untori,* at Milan, in the seventeenth century, when Spanish and clerical control were there at their height. It is a great Catholic man of letters, in our own time, Manzoni, who, in his wonderful novel, the *Promessi Sposi,* and in his *Colonna Infame,* has held up to the abhorrence of the whole world, that persecution,—the torturing of great numbers of worthy citizens to death for causing the plague at Milan by anointing the walls with witch ointment.

Especially curious, too, is Dr. Walsh's statement that there was "only one country in Europe in which, for five centuries, no one was put to death for witchcraft, and that is Ireland." A very proper comment on this assertion may be drawn from the work on "Sorcery and Magic," by Thomas Wright, M.A., F.S.A., a member of the National Institute of France, and an eminently unbiased authority, who, after giving an account of the trial and sentence of Lady Alice Kytteler, in Ireland, in 1324, a trial which took place nearly two hundred years before the Reformation, and in which the Bishop of Ossory was the main persecutor, says, "Ireland would, no doubt, afford many equally remarkable cases in subsequent times, had the chroniclers thought them as well worth recording as the trial of a lady of rank." This statement, on the part of a perfectly fair and unprejudiced historian, would seem to show that the main reason why we have not as many accounts of trials for witch-

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craft in Ireland as elsewhere, is that they were too common to be recorded, or that the people at large, in those rude days, did what people of a similar grade of civilization have done in Russia, namely, themselves punished the witches, without giving much trouble to the courts. How likely this is may be judged from the fact that, as late as 1895, nine persons were charged with capital crime, for burning alive one Bridget Cleary for witchcraft, or diabolical possession, at Clonmel, in Ireland.*

In a note, Dr. Walsh takes pains to state a very important fact in the following words: "It was a Jesuit, Father Spee, who first aroused Christian churches to the awful enormities that were committed under the mask of witch punishment. This is true, and every humane man of every Church must rejoice in the noble effort which Father Spee made, in his *Cautio Criminalis,* to stop the horrible witchcraft persecutions of his time. Every Protestant may well congratulate the older Church, and, indeed, the Order of the Jesuits, on having possessed a man like Spee, and, indeed, two or three others, like Tanner and Laymann, who endeavored to breast this frightful tide of superstition. These men were heroes of humanity, but what Dr. Walsh fails to tell us is that Father Spee was obliged to leave his book unpublished till it found a publisher in the Protestant town of Rinteln, and that its main effect seems to have been first felt by Protestant authorities; nor does he allow us to know that the two or three other Jesuits who took ground against the persecution incurred theological and ecclesiastical disfavor by so doing, and that, next to the Dominicans, the Jesuits were the worst persecutors of witches. The main result of Spee's book was that witchcraft persecution was quietly suppressed in the archdiocese of Mayence during the reign of Archbishop John Philip von Schönborn, who had sat at the feet of Spee and learned from him the enormities of the witchcraft trials, but that succeeding Archbishops reverted to them and continued them until public opinion stopped them.

Dr. Walsh, having dealt with Alchemy and with Witch-

* For the Kytteler case, see the proceedings as published in full by the Camden Society; also Wright, as above. This lady was burned alive for witchcraft in the County of Kilkenny.

For the Bridget Cleary case, see the *Nineteenth Century* for June, 1895, article on "The Witch-burning at Clonmel."

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craft, next proceeds to take up Astronomy, and states that Copernicus, who first propounded the revolution of the earth around the sun as a fact and not a mere hypothesis, was a Catholic priest, and that he dedicated his book on the "Revolutions of the Celestial Bodies" to the reigning Pope. This is all true, but Dr. Walsh does not inform us of the fact that Copernicus, having become convinced, during his residence at Rome, that the earth revolves about the sun, shortly thought it best to get out of Rome, return to his little town in Poland and there publish his book, and that there is ample reason for supposing that, had he not died just as the book was published, he would have been disciplined for it. As it was, the Church has never honored him for his discovery, and when, as late as 1829, Thorwaldsen's statue of him was erected by his countrymen, not one of the eminent ecclesiastics of Poland thought it best to be present. Nor does Dr. Walsh allude to the fact that Copernicus' book, and "all other books affirming the revolution of the earth about the sun," were put upon the Roman Index of books forbidden to be read by Christians, and that, to the copy of the *Index* containing this order, a bull, *Speculatores domus Israel,* issued in 1664, by the reigning Pope, Alexander VII., was prefixed, binding this upon the conscience of all Catholics. It is very interesting, in view of Jesuitical attempts at pettifogging this matter, to record the fact that an English Roman Catholic clergyman, the Reverend Mr. Roberts, was honest enough to allow that the Papal infallibility was fully committed to this prohibition of Copernicus' book and to the doctrine that the sun revolves around the earth, and not the earth around the sun, and, also, that the eminent scientist, St. George Mivart, took the same ground, he being at that time a Catholic.*

As regards Astronomy, Dr. Walsh takes comfort from the fact that Pope Gregory XIII. "proclaimed to the world just what correction was necessary so that the error of the Julian Calendar should not be perpetuated," and refers to the folly of various Protestant peoples, in opposing the reform of the Calendar because the Pope had promulgated it. Every sane Protestant will rejoice with Dr. Walsh that Gregory XIII. was

* See Roberts, "The Pontifical Decrees against the Earth's Movement," London, 1885, especially pp. 54, 132, 133. Also, see St. George Mivart's article in *Nineteenth Century* for July, 1885. I have fully discussed Pope Alexander's bull in my "Warfare of Science," Vol. I, pp. 164-5, and note.

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wise enough to proclaim the reformed calendar, and will join him in execrating the English and Russians who superstitiously stood in the way of this admirable reform.

And, next, the eminent Professor takes up the subject of Geology, and attempts to break the force of the fact that theological influences, both Catholic and Protestant, have been thrown against the science of geology, almost from the first, down to a recent period, by referring to the fact that one of the earliest of modern geologists was a Catholic Bishop, Steno. This is true to this extent, that Steno took a part in the beginnings of modern geology for which every man of science in that field must be grateful to him, and a Professor of History at Fordham might very properly have also referred to the writings of Wiseman, Archbishop of Westminster, in which he endeavored to make a fair compromise between geologists and churchmen, and showed himself far superior in wisdom to most of his ecclesiastical contemporaries, whether Protestant or Catholic. Men like Steno and Wiseman may well be honored by Protestants, but their noble example not only makes the conduct of the Church at large, whether Catholic or Protestant, regarding the progress of science from the Middle Ages down to the present period, appear all the worse.

In conclusion, Dr. Walsh shows a patronizing condescension which is really the most amusing thing in the whole article. He says, "With regard to medicine, I shall have to refer Dr. Cruikshank to my article on 'The Popes and the History of Anatomy,'" and then proceeds to invite Dr. Cruikshank to a course of lectures which Dr. Walsh is to deliver, on kindred subjects.

It must be confessed that nothing in the whole article is more cool and even humorous than to invite a physician, busy with his studies and his practice, to read a labored book, or to attend a course of lectures, the whole substance of which, judging from Dr. Walsh's article, could easily be got from two or three ultra-orthodox encyclopædias. If Dr. Walsh's book or his lectures are at all like his articles, they would seem to rest not on the unbiased statements of men whose main purpose is to seek and serve truth, nor on research into the writings of those who can be considered as fundamental authorities, but they seem drawn entirely, at second hand, from works, either published in countries where Church limitations have been carefully enforced,

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or having, as their avowed aim, the justification of the course of ecclesiasticism and theology toward every subject treated in them.

What is needed in the discussion of this subject is the clean and clear presentation of the truth, from really authoritative sources. It is of no avail to pettifog the questions at issue. The interests of theology, as well as of science, demand not evasions or apologetics, but a lucid and straight-forward showing of the mistakes of the past, in order that they may be avoided in the future.

Nothing is to be gained by a disingenuous hash from partisan encyclopædias.

I remain, dear Sir,

Very respectfully yours,

ANDREW D. WHITE.

In approaching a sincere discussion of the relations which have existed between theology and science, there is nothing calculated to contribute more toward a truthful conclusion than is the elimination from the questions involved of personal feeling. Religious prejudice, bigotry, superstition and sentiment must be laid aside if we would know the real truth. Neither Catholic, Protestant, Jew, nor Gentile should be recognized as such. Creed should not be considered. Those interested should strive to arrive at the truth through an examination of the history of all the facts and circumstances at their command. Each question should be decided strictly on its merits, and a true and full verdict rendered in accordance with the evidence. Unless the subject is approached in this manner no beneficial results can follow. Above all the spirit of good fellowship should prevail. There should be no ill-feeling. Science makes friends, religious superstition makes enemies. The thinking world is becoming more and more of the opinion that acts are of more importance than is belief. Creed cannot take the place of deed. In such discussion there should be mutual forbearance, but the truth should reign supreme. We should respect each other's honest opinions but we have the right to insist that the opinion expressed is in reality honest and without bias. We cannot afford to waste time, energy, and character, on casuistry, indirection and sophistic quibbling.

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Now, let us approach an analysis of the address which Dr. Walsh has so severely criticized, in a spirit of absolute fairness.

Let us endeavor to deal with the religious side of the controversy in the same spirit of impartiality with which we consider the scientific side, leaving out all prejudices. Let us forget, for a few moments, that we are Catholics or Protestants, remembering only that we are men seeking the truth. Let us banish, if possible, all fear from our minds and let us indulge ourselves for a little while in liberty of thought. Let us for a few moments, at least, be intellectually free. Having reached this point let us read carefully the statements as set forth in the address, and then let us ask ourselves, in all fairness, how they compare with the unbiased opinions of accepted authority. In substance, the address holds that from the early part of the fourth century to the period of the Reformation scientific achievement was checked as the result of the machinations of the Church of Rome. Let me quote exact phraseology: "Through the cheerless Papal night of the Middle Ages, that starless night of bigotry, injustice and superstition, that black night which lasted one thousand years, almost every beam of scientific light was lost to the Christian World." May I be permitted to say that the above statement expresses the principal thought contained in my address, and I now desire to reiterate it. Referring to specific declarations concerning the study of geography, geology, and other special branches of science during the Middle Ages, which are made the subject of criticism by Dr. Walsh, I desire to add that those statements set forth the truth as recognized by unprejudiced historians and other impartial writers of medieval history. All the statements which appear in the address were made after proper consideration, and were also made in all sincerity of purpose. They were actuated by neither feeling nor sentiment, but were intended to refer to unbiased historical accounts of the methods of the Roman Church of the Middle Ages, in its dealing with *all branches* of science. And just here I desire to add another statement, which was considered impracticable when the address was made, namely, that the same story of injustice, superstition and ignorance is equally true of the early Protestant Church, in so far as that Church had the power; and also, that in many respects much of the same spirit of intolerance and oppression of thought exists to-day, in strictly orthodox circles, and probably always will. The fact cannot be

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denied that the Christian Church, both Catholic and Protestant, has always insisted that man must mortgage his intelligence in order to save his soul. As evidence of Protestant opposition to the development of science, I desire, in passing, to mention specifically two instances which may perhaps interest physicians because of the direct bearing these instances have on the science of medicine to-day. I refer to the early antagonism to the use of chloroform in the practice of obstetrics and also to the theologic opposition to the administration of quinine in malarial infection. I quote from the work of Andrew D. White, entitled "A History of the Warfare of Science with Theology in Christendom" (Vol. 2, p. 62): "But I pass to a typical conflict in our days and in a Protestant country. In 1847, James Young Simpson, a Scotch physician who afterward rose to the highest eminence in his profession, having advocated the use of anæsthetics in obstetrical cases, was immediately met by a storm of opposition. This hostility flowed from an ancient and time-honored belief in Scotland. As far back as the year 1591, Eufame Macalyane, a lady of rank, being charged with seeking the aid of Agnes Sampson, for the relief of pain at the time of the birth of her two sons, was burned alive on the Castle Hill of Edinburgh; and this old theological view persisted even to the middle of the nineteenth century. From pulpit after pulpit Simpson's use of chloroform was denounced as impious and contrary to Holy Writ; texts were cited abundantly, the ordinary declaration being that the use of chloroform was 'to avoid one part of the primeval curse on woman.' Simpson wrote pamphlet after pamphlet to defend the blessing which he brought into use; but he seemed about to be overcome when he seized a new weapon, probably the most absurd by which a great cause was ever won: 'My opponents forget,' he said, 'the 21st verse of the 2d chapter of Genesis; it is the record of the first surgical operation ever performed and that text proves that the Maker of the Universe, before he took the rib from Adam's side for the creation of Eve, caused a deep sleep to fall upon Adam.' This was a stunning blow, but it did not entirely kill the opposition; they had strength left to maintain that the 'deep sleep of Adam took place before the introduction of pain into the world—in a state of innocence.' But now a new champion intervened—Thomas Chalmers; with a few pungent arguments from his pulpit he scattered the enemy forever and the greatest battle of science against suffering was won. This victory was won not

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less for religion. Wisely did those who raised the monument at Boston to one of the discoverers of anæsthetics inscribe upon its pedestal the words from our Sacred Text, 'This also cometh from the Lord of Hosts which is wonderful in counsel and excellent in working.'"

With regard to the introduction of the use of quinine in the treatment of disease, Dr. White has this to say: "In the early years of the seventeenth century the Jesuit missionaries of South America learned from the natives the value of the so-called Peruvian Bark in the treatment of ague; and in 1638 the Countess Cinchon, Regent of Peru, having derived great benefit from the new remedy, it was introduced into Europe. Although its alkaloid, quinine, is perhaps the nearest approach to a medical specific, and has diminished the death rate in certain regions to an amazing extent, its introduction was bitterly opposed by many conservative members of the Medical Profession, and in this opposition large numbers of ultra-Protestants joined out of hostility to the Roman Church. In the heat of sectarian feeling the new remedy was stigmatized as 'an invention of the devil'; and so strong was this opposition that it was not introduced into England until 1653, and even then its use was long held back owing mainly to anti-Catholic feeling. What the theological method, on the ultra-Protestant side, could do to help the world at this very time, is seen in the fact that while this struggle was going on, Hoffman was attempting to give a scientific theory of the action of the devil in causing Job's boils."

History is replete with accounts of similar interferences on the part of theology in its dealing with scientific endeavors for the alleviation of human suffering. Its neglect of ethics, its lack of the spirit of humanitarianism, its thoughtlessness of the real welfare of the masses, its selfish greed, its policy of aggrandizement may all be realized in reading a few lines of Winwood Reade's "Martyrdom of Man." In his description of the Christian Night of the Middle Ages, he says: "The castle is the home of music and chivalry and family affection. The convent is the home of religion and of art, but the people cower in their wooden huts, half starved, half frozen, and wolves sniff at them through the chinks in the walls. The convent prays and the castle sings; the cottage hungers and mourns and dies. Such is the Dark Night; here and there a star in the heaven;

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here and there a torch upon the earth; all else is cloud and bitter wind." But to return to the article by Dr. Walsh, and allow me to quote his exact words:*

"Here is the next sentence of Dr. Cruikshank's paragraph: 'For one thousand years in Papal Christendom the study of astronomy was considered criminal and frequently paid the penalty of imprisonment and death.'" "No statement," says Dr. Walsh, "could possibly be more false than this. The proper study of astronomy was always encouraged by the popes and all other clerical authorities." When I read this statement and realize that it emanates from a Professor of History I must confess to utter amazement.

I know of no statement which could be more defiant of the truth. Fancy the encouragement given Galileo, in his attempts to demonstrate to the world the Copernican System, by such sympathetic theologians as Pope Paul V., Urban VIII., the Archbishop of Pisa, Cardinal Bellarmin, Father Grassi, Father Lorini, Father Busaeus, Monsignor Elci, Father Caccina (the Dominican who received promotion at the hands of the Church because he insisted that "geometry is of the devil," and also, that "mathematicians should be banished as the authors of all heresies"), Father Melchoir Inchofer, Fromundus of Antwerp, the Bishop of Fiesole, Martin Luther, Melanchthon, John Calvin (who said, "Who will venture to place the authority of Copernicus above that of the Holy Spirit?") and John Wesley (who declared the new ideas to "tend toward infidelity"). Apropos of Dr. Walsh's statement that the "proper study of astronomy was encouraged by the popes and all the other clerical authorities," I desire to call attention to Chapter III, Vol. 1, p. 131, of White's "Warfare of Science," entitled "The War upon Galileo." The author says: "I shall present this Warfare at some length, because, so far as I can find, no careful summary of it has been given in our language, since the whole history was placed in a new light by the revelations of the trial documents in the Vatican Library, honestly published for the first time by L'Epinois in 1867, and since by Gebler, Berti, Favaro, and others." Dr. White's evident exhaustive examination of the documentary evidence at his command, together with his citations of authorities on this question, renders the following language, quoted from page 136 of the same volume, most convincing: "The whole struggle to crush Galileo and to

*Loc. cit., p. 261.

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save him would be amusing were it not so fraught with evil. There are intrigues and counter-intrigues, plots and counter-plots, lying and spying; and in the thickest of this seething, squabbling, screaming mass of priests, bishops, archbishops, and cardinals, appear two popes, Paul V. and Urban VIII. It is most suggestive to see in this crisis of the Church, at the tomb of the prince of the apostles, on the eve of the greatest errors in Church policy the world has known, in all the intrigues and deliberations of these consecrated leaders of the Church, no more evidence of the guidance or presence of the Holy Spirit than in a caucus of New York politicians at Tammany Hall. . . . But the opposing powers were too strong. In 1615 Galileo was summoned before the Inquisition at Rome, and the mine which had been so long preparing was sprung. Sundry theologians of the Inquisition having been ordered to examine two propositions which had been extracted from Galileo's letters on the solar spots, solemnly considered these points during a month and rendered their unanimous decision as follows: *'The first proposition that the sun is the centre and does not revolve about the earth, is foolish, absurd, false in theology, and heretical, because expressly contrary to Holy Scripture;'* and *'the second proposition, that the earth is not the centre but revolves about the sun, is absurd, false in philosophy, and, from a theological point of view at least, opposed to the true faith.'*

"The Pope himself, Paul V., now intervened again: he ordered that Galileo be brought before the Inquisition. Then the greatest man of science in that age was brought face to face with the greatest theologian—Galileo was confronted by Bellarmin. Bellarmin shows Galileo the error of his opinion and orders him to renounce it. DeLauda, fortified by a letter from the Pope, gives orders that the astronomer be placed in the dungeons of the Inquisition should he refuse to yield. Bellarmin now commands Galileo, 'in the name of His Holiness the Pope and the whole Congregation of the Holy Office, to relinquish altogether the opinion that the sun is the centre of the world and immovable, and that the earth moves, nor henceforth to hold, teach or defend it in any way whatever, verbally or in writing,' This injunction Galileo acquiesces in and promises to obey.

"This was the 26th of February, 1616. About a fortnight later the Congregation of the Index, moved thereto, as the letters and documents now brought to light show, by Pope Paul

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V., solemnly rendered a decree that *'the doctrine of the double motion of the earth about its axis and about the sun is false, and entirely contrary to Holy Scripture;'* and this opinion must neither be taught nor advocated. The same decree condemned all writings of Copernicus and *'all writings which affirm the motion of the earth.'* The great work of Copernicus was interdicted until corrected in accordance with the views of the Inquisition; and the works of Galileo and Kepler, though not mentioned in name at that time, were included among those implicitly condemned as 'affirming the motion of the earth.'

"The condemnations were inscribed upon the *Index;* and, finally, the papacy committed itself to an infallible judge and teacher of the world by prefixing to the *Index* the usual papal bull giving its monitions the most solemn papal sanction. To teach or even read the works denounced or passages condemned was to risk persecution in this world and damnation in the next. Science had apparently lost the decisive battle."

What is to be thought of the suggestion that the study of astronomy was encouraged by popes and clerical authority, in the face of the real facts? How does Dr. Walsh reconcile his teaching with the documentary evidence in the Vatican Library to which Andrew D. White refers? Listen to the words of recantation which were forced on Galileo by those who, according to Dr. Walsh; encouraged the study of astronomy. "I, Galileo, being in my seventieth year, being a prisoner, and on my knees, and before your Eminences, having before me the Holy Gospel, which I touch with my hands, abjure, curse and detest the error and the heresy of the movement of the earth." "Many have wondered," says Andrew D. White, "at the abjuration and, on account of it, have denied Galileo the title of Martyr. But let such gainsayers consider the circumstances. Here was an old man—one who had reached the allotted threescore and ten years —broken with disappointments, worn out with labors and cares, dragged from Florence to Rome, with the threat from the Pope himself that if he delayed he should be 'brought in chains;' sick in body and mind, given over to his oppressors by the Grand Duke who ought to have protected him, and on his arrival in Rome threatened with torture. What the Inquisition was he knew well. He could remember as but yesterday, the burning of Giordano Bruno, in that same city, for scientific and philosophic heresy; he could remember, too, that only eight years before this

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very time, De Dominis, Archbishop of Spalatro, having been seized by the Inquisition for scientific and other heresies, had died in a dungeon, and that his body and his writings had been publicly burned. To the end of his life—nay, after his life was ended—the persecution of Galileo was continued. He was kept in exile from his friends, from his family, from his noble employments, and was held rigidly to his promise not to speak of his theory. When, in the midst of intense bodily suffering from disease, and mental sufferings from calamities in his family, he besought some little liberty, he was met with threats of committal to a dungeon. When, at last, a special commission had reported to the ecclesiastical authorities that he had become blind and wasted with disease and sorrow, he was allowed a little more liberty, but that little was hampered with close surveillance. He was forced to hear contemptible attacks on himself and on his works in silence; to see the man who had befriended him severely punished; Father Castelli banished; Riccardi, the Master of the Sacred Palace, and Campoli, the Papal Secretary, thrown out of their positions by Pope Urban, and the Inquisitor of Florence, reprimanded for having given permission to print Galileo's work. He lived to see the truths he had established carefully weeded out from the Church Colleges and Universities in Europe; and when, in a specific work, he happened to be spoken of as 'renowned,' the Inquisition ordered the substitution of the word 'notorious.' And now measures were taken to complete the destruction of the Copernican System, with Galileo's proofs of it. On the 16th of June, 1633, the Holy Congregation, with the permission of the reigning Pope, ordered the sentence upon Galileo and his recantation to be sent to all the papal nuncios throughout Europe, as well as to all the Archbishops and Inquisitors in Italy; and this document gave orders, that the sentence and abjuration be made known to all your vicars, that you, and all professors of philosophy and mathematics, may have knowledge of it, that they may know why we proceeded against the said Galileo, and recognize the gravity of his error, in order that they may avoid it, and thus not incur the penalties which they would have to suffer in case they fell into the same.'" Galileo was persecuted by the Church authorities until he died, and his persecution followed his body into the grave. He was denied the right of burial in his family tomb. Pope Urban refused permission to the dead scientist's friends to erect a monument over his remains. He was buried ignobly and without epi-

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taph. And this is the encouragement given to the study of astronomy by the clerical authorities, to which Dr. Walsh has so kindly called our attention.

Is it possible that Dr. Walsh does not know, what every intelligent and unprejudiced reader of history must know, namely, that whatever knowledge of astronomy was developed from the time of St. Augustine to the Reformation, and long beyond that period, was developed in spite of theology, and not with its permission—that a terrible conflict was waged between truth and dogma? Is it possible that Dr. Walsh does not know that every movement which was made by science during the Middle Ages for the purpose of explaining natural phenomena was opposed by theological authority, that the Church vigorously antagonized every conclusion resulting from scientific investigation along astronomical lines, as well as attempts at scientific investigations along other lines which opposed the Sacred Scriptures, with excommunication, torture, imprisonment and death? Is Dr. Walsh not familiar with the pitiful history of the persecution and imprisonment of Galileo, because that great religious and scientific mind advocated the Copernican system? Is Dr. Walsh not acquainted with the history of the persecution and hounding, from country to country, of Bruno, and finally his murder at Rome by the Holy Inquisition? Is he unfamiliar with the history of the persecution of Roger Bacon, the Franciscan friar, who was imprisoned because he opposed in scientific matters, the dogmatic teachings of his Church? Is it possible that Dr. Walsh is ignorant of the long history of the shedding of innocent human blood which resulted from opposition to the accepted teachings of the Holy Scriptures? Is he not aware that the Church went into partnership with the tyrants of the throne, and that between these two vultures, the altar and the throne, the heart of man was devoured? Does he not know that hundreds of volumes could not contain the crimes that have been committed by the Church for the purpose of converting the world to her ignorance and superstition? Is it possible that Dr. Walsh does not know these things; or is he blinded to them? Let those of my readers who have not already done so read Dr. Walsh's article in reply to my address and then let them read the work of Dr. Andrew D. White to which I have previously referred. This work is considered, in the world of letters, an authority. It is absolutely impartial. The author refers his reader to documentary evidence for verification of every im-

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portant statement on theological and scientific questions. I desire to take this opportunity to commend the book to all who are interested in seeking the truth concerning the subject matter of which it treats. Permit me to suggest to those who may not have the leisure to read the whole work, that they read Chapter XII of the first volume, entitled "From Magic to Chemistry and Physics," and then let them judge for themselves how theological authority persecuted Catholic and Protestant alike, because of attempted scientific achievement in Chemistry which opposed the sacred doctrines of the Church. Let them read the "History of the Conflict between Religion and Science," by Professor John W. Draper; and I would call their attention, especially, to Chapter X of that work, which is entitled "Latin Christianity in Relation to Modern Civilization." Read Dr. Draper's unbiased description of the condition of European civilization after it had been dominated by one thousand years of Roman despotism and Latin Christianity, and compare the account there given with the teachings of Dr. Walsh. Let us see for a moment, what is said on the subject by Professor Ernst Hæckel in his "Riddle of the Universe." I quote from page 314 of that work: "It is the despotism of the papacy that lent its darkest character to the Middle Ages; it meant death to all freedom of mental life, decay to all science, corruption to all morality. From the noble height to which the life of the human mind had attained in classical antiquity, in the centuries before Christ, and the first century after Christ, it soon sank, under the rule of the papacy, to a level which, in respect of the knowledge of the truth, can only be termed barbarism. It is often protested that other aspects of mental life-poetry and architecture, scholastic learning and patristic philosophy, were richly developed in the Middle Ages. But this activity was in the service of the Church; it did not tend to the cultivation, but to the suppression, of free mental research. The exclusive preparing for an unknown eternity beyond the tomb, the contempt of nature, the withdrawal from the study of it, which are essential elements of Christianity, were urged as a sacred duty by the Roman hierarchy. It was not until the beginning of the sixteenth century that a change for the better came in with the Reformation. . . The reader who desires a closer acquaintance with the subject would do well to consult the historical works of Ranke, Draper, Kolb, Svoboda, etc. The truthful description of the awful condition of the Christian Middle Ages, which is given by these and other unprejudiced historians,

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is confirmed by all the reliable sources of investigation, and by the historical monuments which have come down from the saddest period of human history. Educated Catholics, who are sincere truth-seekers, cannot be too frequently recommended to study these historical sources for themselves. This is the more necessary as ultramontane literature has still a considerable influence. The old trick of deceiving the faithful by a complete reversal of facts and an invention of miraculous circumstances is still worked by it with great success. We will only mention Lourdes and the 'Holy Coat' of Trêves. The ultramontane professor of history at Frankfort, Johannes Janssen, affords a striking example of the length they will go in distorting historical truth; his much-read works (especially his history of the German people since the Middle Ages) are marred by falsification to an incredible extent. The untruthfulness of the Jesuitical productions is on a level with the credulity and the uncritical judgment of the simple German nation that takes them for Gospel.

"One of the most interesting of the historical facts which clearly prove the evil of the ultramontane despotism is its vigorous and consistent struggle with science. This was determined on, in principle, from the very beginning of Christianity, inasmuch as it set faith above reason and preached the blind subjection of the one to the other; that was natural, seeing that our whole life on earth was held to be only a preparation for the legendary life beyond, and thus scientific research was robbed of any real value. The deliberate and successful attack on science began in the early part of the fourth century, particularly after the Council of Nicæa (327), presided over by Constantine—called the "Great" because he raised Christianity to the position of a state religion, and founded Constantinople, though a worthless character, a false-hearted hypocrite, and a murderer. The success of the papacy in its conflict with independent scientific thought and inquiry is best seen in the distressing condition of science and its literature during the Middle Ages. Not only were the rich literary treasures that classical antiquity had bequeathed to the world destroyed for the most part, or withdrawn from circulation, but the rack and the stake insured the silence of every heretic—that is, every independent thinker. If he did not keep his thoughts to himself, he had to look forward to being burned alive, as was the fate of the great monistic philosopher, Giordano Bruno, the reformer, John Huss, and more

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than a hundred thousand other 'witnesses to the truth.' The history of science in the Middle Ages teaches us on every page that independent thought and empirical research were completely buried for twelve sad centuries under the oppression of the omnipotent papacy. . . . Instead of Christian charity, it introduced a fanatical hatred of the followers of all other religions; with fire and sword it pursued, not only the heathen, but every Christian sect that dared resist the imposition of ultramontane dogma. Tribunals for heretics were erected all over Europe, yielding unnumbered victims, whose torments seemed only to fill their persecutors, with all their Christian charity, with a peculiar satisfaction. The power of Rome was directed mercilessly for centuries against everything that stood in its way. Under the notorious Torquemada (1481-98), in Spain, alone, eight thousand heretics were burned alive and ninety thousand punished with the confiscation of their goods and the most grievous ecclesiastical fines; in the Netherlands, under the rule of Charles V., at least fifty thousand men fell victims to the clerical bloodthirst. And while the heavens resounded with the cry of martyrs, the wealth of half the world was pouring into Rome, to which the whole of Christianity paid tribute, and the self-styled representatives of God on earth and their accomplices (not infrequently Atheists themselves) wallowed in pleasure and vice of every description. 'And all these privileges,' said the frivolous, syphilitic Pope Leo X., 'have been secured to us by the fable of Jesus Christ.'"

The picture here drawn by Professor Hæckel is no exaggeration. It is nothing more than a fair representation of the moral depravity and injustice concerning scientific achievement to which theological dogmatism had sunk the whole orthodox Christian world. Its ramifications extended alike to all branches of science, geology, geography, astronomy, medicine, physics, chemistry and all other departments of knowledge which were not in accord with the inspired interpretations of the Holy Scriptures. If any of my readers doubt the accuracy of my statements let them read for themselves the accounts of unbiased historians. Let them examine the unprejudiced history of this human beast of prey familiarly known as theological dogma, this monster in crime, this serpent in malice, this tyrant in power, this hypocritical, scheming, fawning beggar in weakness; we behold it seizing by the throat, and throttling to the death, attempts at

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scientific achievement, intriguing to destroy, and persecuting to the utmost of its power the greatest intellects the world has known. It has waylaid and aborted liberty of thought and it has assassinated freedom of speech. It has plunged superstition's dagger into the hearts of the noblest and the best. It has filled the world with fear and in this way enslaved the human heart and brain. It has pierced with its keen and bloody sword the vitals of manhood's noblest aspirations. It has insisted on the total depravity of the human heart and through this malignant doctrine it has set the seal of everlasting torture on the smiling face of the innocent babe. Its inspired interpreters, through conflict of opinion and hostility of sect, have changed words of peace, mercy, and wisdom into torches of discord and made them signals for wars of extermination, murder, and sanguinary strife, throughout the eastern and western world, thus deluging, for hundreds of years, the whole earth with red streams of wasted life. It has traded on the hopes, fears, and hunger of the human heart. It has enslaved woman and placed superstition's curse on her holiest function. It has saddened the lives of millions and filled the world with the gloom of the darkest night. It stands to-day the despotic sovereign of ignorance and hypocrisy. And through all the sad and weary years of human sorrow and anguish, in spite of the tyranny which has been inflicted by this monster's cruel fangs, its sharpened claws, its ravenous thirst for human sacrifice, the heart of man has continued to endure; his soul has risen higher and higher toward nobler realms; his mind has struggled in the shadows of oppression's doubt and fear, but he has nobly held the sacred torch of science high above his sorrowing head and through its glittering light the world beholds the dawning of the grander day.

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EUROPEAN MEDICINE: A RESUME OF MEDICAL PROGRESS DURING THE EIGHTEENTH AND NINETEENTH CENTURIES.

(*Concluded.*)

By E. J. Kempf, M.D.

PHYSIOLOGICAL THEORY OF MEDICINE.

THE Physiological Theory of Medicine was originated by *Broussais* (1772-1838) and was a combination of the theories that had immediately preceded it. According to him life depended upon external irritation produced by heat, which excites new chemical processes, while these in turn stimulate regeneration, assimilation, as well as contractility and sensibility. When the functions supported by heat cease, death ensues. Health depends upon moderate action of external irritants; disease, upon either their weakness or their extraordinary strength. He saw nothing ontological about disease. In therapeutics he admitted the healing power of Nature. Febrile and inflammatory diseases were all treated by the withdrawal of nourishment, carried to the extreme. Bleeding was the main treatment—leeches and lancet.

SCHOOL OF PATHOLOGICAL ANATOMY AND DIAGNOSIS.

Contemporaneous with the School of Broussais and its antagonist — the Homeopathic System — was the Paris School of Pathological Anatomy and Diagnosis, which has given tone to the Medical Art. It made it the duty of the physician to search for changes in the human body, to investigate the local products of the disease, and assigned to medicine the duty of removing the products. The proper founders of this school were Corvisart, Dupuytren, and Laennec. One of its adherents was Bayle, who was the first to apply the ear to the thorax in diseases of the heart. Its most celebrated member was Cruveilhier, who revived the Anatomical Society, and wrote his famous treatise on Pathological Anatomy, illustrated with magnificent plates. Like Morgagni he associated general anatomy and pathological anatomy with bedside observations. To this system of medicine must be traced the practice of specialism in medicine and surgery so characteristic of the present day. The medical world has become

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practically an enormous school of pathological anatomy and diagnosis—a school inaugurated by Bichat, as representing the so-called regular school of medicine.

ROKITANSKY'S NEW VIENNA SCHOOL.

An offshoot of the French School of Pathological Anatomy and Diagnosis was the so-called New Vienna School, the most eminent member of this system being von Rokitansky, who was a pathologist pure and simple, having performed more than thirty thousand autopsies during his life.

Karl Rokitansky (1804-1878) was born in Bohemia and studied medicine at Prague and Vienna. In 1844 he was appointed professor of pathological anatomy at the University of Prague, of which he became honorary director in 1848. He was made rector of the University of Vienna in 1850, and resigned his professorship in 1874. His chief book is "Handbuch der Pathologischen Anatomie," 1846. He is still considered one of the first authorities on pathology.

Rokitansky's friend and colaborer, *Skoda* (1803-1881), was the first medical man to lecture in German. His scientific merit was based upon the fact that he overthrew the specific and pathognomic arrangement of signs, as taught by the French, and substituted therefor a category, based upon the physical constitution and shape of organs and tissues. His endeavor was to develop a strictly scientific system of medicine out of the empirical French system or doctrine of physical signs, and in his work on Physical Diagnosis he displayed an independent spirit, though as one who received his impulse from the teachings of the French.

To Skoda must be laid the blame for the fact that practical medicine degenerated into simple diagnosis, and that by his observations on the natural course of disease, undisturbed by therapeutics, he became the founder and exponent of expectant and nihilistic therapeutics, the harbinger of a very cheerless period in the history of medicine of the German Empire. From this idea of diagnosis above everything, the Germans are but now rallying, and are paying more attention to the cure of disease than they did only ten years ago.

Oppolzer, Hebra, Jäger, Graefe, Fuchs, Mauthner, Hasner, Donders, Arlt, Stellwag, Politzer, and others are some of Skoda's distinguished contemporaries, to whose influence in

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medicine more than any other list of men, is due the advanced condition of the various branches of the medical art, or the so-called specialties, and we will find it necessary to consider their names again later on in our history.

PHYSIOLOGICAL MEDICINE.

An offshoot of the New Vienna School is the so-called Physiological School founded by *Roser* (1817-1888), seconded by Griesinger and Wunderlich. Their claim was that Physiology must include vital phenomena, while from the morbid portions of these phenomena the special science should be formed as an artificial yet practical division of knowledge. Wunderlich's book on Therapeutics was for a long time the best guide in that direction, inasmuch as he left to individual thought and judgment—the Hippocratic method of investigation—the determination of value and demand. Wunderlich claimed that pathology was the physiology of the sick, whilst Henle, who started a school in opposition, under the name of *Rational Medicine*, made no distinction at all between the physiology of the well and the sick.

RADEMACHER'S SYSTEM.

Rademacher's system of medicine can be traced directly to the vagaries of Paracelsus, which had given rise to so many other schools, among the number being Homeopathy. The followers of the medical doctrine that bears the name of Rademacher classified the diseases of man by their therapy: they had but three universal remedies, namely, nitrate of sodium, copper, and iron, and therefore but three diseases—sodic nitrate, copper, and iron diseases.

HYDROPATHY.

Vincent Priessnitz, the founder of Hydropathy, was born at Graefenberg, in Austrian Silesia, 1799. Priessnitz, having his attention called to the virtues of cold water in the treatment of a bruise he had received from the kick of a horse, and being possessed of sharpness of intellect and aptitude for the practice of the healing art, though he had only a very common school education, began to give advice to his neighbors and friends how to cure all ailments with cold water, and soon attained con-

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siderable reputation among them. Priessnitz left nothing in writing on his method of cure, but Wunde described his system under the title of "Die Priessnitsche Kurmethode."

The efficacy of water in the cure of numerous forms of disease has long been recognized, indeed as long as history can tell us. Water was largely employed by Hippocrates in the treatment of many diseases; and, along with the regular diet and an implicit belief in the vis medicatrix naturæ, it appears to have formed the chief element in his medical armory. Both Celsus and Galen speak favorably in their writings of the use of water in the cure of disease, regarding it as of high value in the treatment of acute complaints, particularly of fevers. Throughout the Middle Ages, likewise, many physicians, including Aetius and Paulus Aegineta, and the celebrated quack, Paracelsus, were advocates of the remedial virtues of water; all of them, however, having faith in its uses in the treatment of acute complaints, particularly of fevers, rather than in the possible cure of chronic cases.

In 1715 Niccolo Lanzoni, a Neapolitan physician, published a learned treatise on the subject of Hydropathy. In England, about the beginning of the eighteenth century, Floyer and Baynard made large use of water in the treatment of acute chronic diseases. Their conjoint work entitled "Psychrolousia; or the History of Cold Bathing both Ancient and Modern," is replete with quaint learning and practical shrewdness and sagacity. But the most able and scientific among the older treatises on the subject of the water treatment, is the work of the well-known Dr. Currie, published in 1797, and entitled "Medical Reports on the Effects of Water, Cold and Warm, etc." In this work Currie recommends the cold effusion in typhus and other fevers, and gives practical directions in regard to the cases and the times when it may be used with advantage. This practice was considered too dangerous by Currie's contemporaries and fell into speedy disuse or neglect, but at the present time these views, with but little change, are admitted by eminent physicians to be scientific in principle and practical in use.

Whilst Priessnitz had practically very little to do with the founding of Hydropathy, except as a form of quack treatment of various diseases, in which he was remarkably successful, Winternitz has made hydrotherapy popular and in a measure successful. Cold baths have become popular in the treatment of fevers,

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such as typhoid fever, pneumonia, etc., and are used in the form of ice-pack, bath-tub immersion for a variable period of time, sponge-bath, shower-bath, sweat-bath, etc. Baths have their place and uses in the treatment of skin diseases and in the treatment of syphilis, rheumatism, etc., but are not used very much in private practice. Their proper place is in the therapy of the hospital and the sanitarium.

COMPARATIVE ANATOMY.

Georges Leopold Christian Frederick Dagobert Cuvier was born in the year 1769, at Montbeliard, a small town of Alsace. Cuvier gave early indications that nature had endowed him with her choicest intellectual gifts. After showing much zeal and energy in his youth and receiving the highest academical prizes, he turned his attention to Natural History, and was appointed professor of this branch of study at Paris in the year 1795. He soon gained a great reputation through his researches and discoveries in comparative anatomy, and his achievements in science have spread his fame over the civilized world.

Paul Joseph Barthez, born at Montpellier, 1734, founded a medical school at Montpellier, which gained a great reputation all over the civilized world. Barthez was considered one of the most learned physicians of France. His principal medical work was entitled "Nouveaux Elémens de la Science de l'Homme," which was published in 1778, and received great attention from the medical fraternity, on whose future welfare it had great influence.

Antoine Dubois (1756-1837) was a French surgeon of great skill and possessed a wide reputation as a practitioner and teacher of medicine. It was he who saved both the Empress Marie Louise and her child at the accouchement, when the Emperor Napoleon gave out his famous saying *"Give the mother the first chance."* This principle has since been generally adopted by the medical profession.

Guillaume Dupuytren, born in France in the year 1777, located at Paris, and engaged in the practice of his profession. In 1801 he studied pathological anatomy with intense ardor. After a time Dupuytren became the chief surgeon of his day. Possessing extraordinary penetration in diagnosis, immovable firmness of nerve, and being bold and skilful in operating, nothing within the power of a surgeon was beyond his grasp, taking

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into consideration the times in which he acted. Dupuytren was the inventor of many ingenious modes of operating, and of many surgical instruments, and he left the record of several important discoveries in pathological anatomy. He was the leader of an enlightened school of surgeons surpassed by none in his day and generation.

Sebaldus Justinus Brugmans (1763-1819), a Dutch physician, improved the condition of the military hospitals, and by his efforts the 20,000 soldiers wounded at the battle of Waterloo were properly cared for. Many of his medical papers were published and were highly esteemed by the medical men of the day.

Alessandro Volta, who was born in Italy, in 1745, made contributions to the science of electricity which were of great importance; the chief of them being his theory that the electrical power or principle resides in the metals. He also invented an electric battery, the electrophonus, the electrical condenser, the electrical pistol, and the hydrogen lamp. After Volta Galvanism is often termed Voltaic electricity; and the practical unit of electro-magnetic force is called a *volt.*

Karl Ferdinand Von Graefe (1787-1840) was born at Warsaw, graduated at Leipsic, and in 1811 was appointed professor of surgery at Leipsic. He superintended Napoleon's military hospitals. He also revived the operation of rhinoplasty. His contemporary and friend, *Karl Gustavus Carus,* was justly renowned for his efforts in comparative anatomy. Another contemporary was *Civiale,* a French surgeon, who performed lithotrity for the first time in 1824, which operation has been greatly improved since Civiale's time, notably by Henry J. Bigelow.

Hermann von Helmholtz, born at Potsdam, 1821, wrote some valuable physiological works in connection with the eye and the nervous system.

Jean Marie Gaspard Itard (1775-1838), born in France, rose to prominence as a physician and instructor of the deaf and dumb, without having received any previous training or education, medical or otherwise. His "Diseases of the Ear," in two volumes, published in 1821, is a standard medical work, still held in high esteem.

François Magendie (1783-1855) was an eminent French physiologist and physician. He was the first to prove experimentally that the veins are organs of absorption; he gave a more extended and accurate account of the process of vomiting than

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had been previously given by any other physiologist; he pointed out that non-nitrogenous foods are non-nutritious, and that an animal cannot live solely on any one kind of food, however nitrogenous it might be; he investigated the physiological action and therapeutic uses of hydrocyanic acid and strychnia; he performed an important series of experiments on the cause of death when air is admitted into the large veins; he made numerous experiments to determine the functions of the various nerves and of different parts of the brain; and lastly, he shares with *Sir Charles Bell* the honor of having discovered the separate functions of the two roots of the spinal nerves. Magendie's chief physiological work, the "Elémens de Physiologie," was translated into English, and was for many years the best physiological work in any language, and is still used as a work of reference by the physiologists of to-day.

Cloquet, who was Magendie's contemporary and friend, was an eminent anatomist and a good surgeon. His work on "Anatomy" was issued in three volumes, and was highly esteemed. As a surgeon he invented many surgical instruments, which are still in use, and improved many surgical operations.

Dieffenbach, born in Prussia, 1782, became one of the greatest surgeons Prussia ever produced. He was especially noted as a surgeon in remedying deformities of the nose, and of the eyes, and of those deformities that were the cause of impediments of the speech. His work on the "Treatment of Stammering" may be still considered as an extremely valuable one. His great work on "Operative Surgery," published in 12 volumes, was translated into several languages.

Flourens, a celebrated French physiologist, who was born at Herault, 1794, graduated at Montpellier, 1813, at the age of 19 years. He became a voluminous writer on human anatomy and physiology and on comparative anatomy.

Jean Nicolas Gannal (1791-1852) was a French chemist noted for his discovery of the efficacy of injections of acetate and chloride of aluminum in preserving anatomical preparations. He accomplished embalming without mutilation of the body for the study of anatomy, by injecting into the carotid arteries solutions of aluminum salts. Many improvements in embalming have been made since Gannal's time, and at present formaldehyde has assumed a prominent place in the process of embalming of the dead human body.

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The great triumvirate of the Paris Medical School during the middle part of the nineteenth century, *i.e.,* Andral, Chomel, and Louis, left the impress of their talent and skill on medicine. *Andral,* born at Paris, 1797, was a member of the Institute and Academy of Medicine, and flourished as professor of hygiene in 1828, and succeeded Broussais as professor of pathological anatomy in 1839. Andral's various published works will always remain as monuments of his fame. Among them are his "Clinique Médicale," "Digest of Pathological Anatomy," a "Treatise on Mediate Auscultation," a book on "Diseases of the Heart," three volumes on "Internal Pathology," and his "Researches on the Blood." Andral's lectures were full of learning, very carefully prepared, and methodically arranged. Andral is noted in medical history as a great pathologist.

Philip Ricord, born at Baltimore, 1800, and graduated at Paris in 1826, won a world-wide fame in the treatment of venereal diseases, a reputation which he owed to his combination of accurate physiological and pathological knowledge with great manual dexterity as a surgeon, and felicitous inventiveness and resource as a physician. His lectures and writings on syphilology, gonorrhea, and genito-urinary surgery have never been excelled for their fluency and grace of style, as well as for thorough knowledge of the subject. Ricord may be considered the greatest authority on venereal diseases the world ever produced. His works are too numerous to mention, except to say that they cover the whole field of genito-surgery and syphilology.

Johann Mueller, born at Coblentz, 1801, was an eminent physiologist. He wrote voluminously on the subject of physiology and is considered one of our leading authorities on the subject of histology.

The name of *Nicholas Pirogoff* stands out pre-eminently in the medical history of Russia. As a military surgeon he had no superior. He was to General Todleben, of Crimean fame, what Baron Larrey was to Napoleon Bonaparte. His classic work on military surgery was translated into many languages, and is still held in high esteem. Russia has honored the memory of Pirogoff in a most worthy manner by establishing and maintaining at St. Petersburg a meseum known as the Pirogoff Museum. This museum is an ideal home for the medical profession, containing as it does a rich museum, in which are preserved the instruments used by Pirogoff in the Crimean campaign, a hall

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for general meetings, and all that could be desired for the different specialties in medicine, with general and special libraries.

Justus von Liebig, born at Darmstadt, 1803, labored with great success in all the departments of chemistry, but particularly in organic chemistry, in which he made many discoveries, and did much to improve the method of analysis. In analytical chemistry he is especially noted, and also on the subject of fermentation, being for many years the greatest authority on the subject. Liebig's style was both terse and elegant, flowing naturally from a clear and strong intellect, and his capacity for severe and continued work was immense.

Joseph Hyrtl, born in Hungary, 1811, is considered an authority on comparative anatomy, and on the anatomy of the ear. He figured long and successfully at the University of Vienna as professor of topographic and comparative anatomy, and his work, "Handbuch der topographischen Anatomie," is highly regarded as a text-book on the subject by all the anatomists of the world.

HISTOLOGY.

Albrecht von Koelliker, born in Germany, 1817, rose to the position of professor of anatomy and physiology in the University of Wuerzburg. He is distinguished principally for his labors in the department of Microscopic Anatomy or Histology.

Johannes Mueller, a German by birth, published in 1830 an elaborate commentary on the minute structure of the glands, the first work in which the anatomy of the organs was examined and elucidated in a comprehensive manner and systematic way. *Ehrenberg,* 1830, explained the structure of numerous infusoria, and disclosed the peculiarities of many other structures, animal, vegetable, and mineral, which had previously eluded the most skilful researches. *Francis Kiernan,* in 1833, gave the first correct account of the minute anatomy of the liver. *Schleiden* and *Schwann,* in 1839, published most important generalizations on the cellular structures of vegetable and animal organisms. *Martin Barry* communicated new facts on the structure of the ovum and on the structure of cells generally. *John Goodsir* laid great emphasis on the office of the nucleus in the nutrition, growth, and reproduction of cells, and on the arrangement of the cells within an organism into departments and territories. Virchow, by his researches into connective tissues, has still further devel-

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oped the idea of the cellular structure of the animal organism, and the importance of physiological and pathological processes. *Lionel Beale* attributed, both to the nucleus and to the substance of the cell immediately surrounding it, important functional properties. *Max Schulte* showed the identity in the nature between the sarcode substances of the lower animal organism and the contents of the cells in the higher animals, and applied to these substances the common term protoplasm, which had been previously introduced by Hugo Von Mohl to designate a similar material in the vegetable cell.

Auguste Nélaton (1807-1873), born at Paris, was a noted surgeon and teacher of surgery. Nélaton's soft rubber catheter, and Nélaton's probe, having an unpolished porcelain knob at its end, were introduced into surgery by Nélaton; the latter, though well known to every surgeon, is not used a great deal at the present time, thanks to the more modern methods. Nélaton also improved the operation of lithotomy in several ways and in genito-surgery he deserved the high esteem in which he was held by the medical profession.

Charles Edward Brown-Séquard, born in Mauritius, 1818, studied medicine at Paris, where he took his degree of M.D. in 1840. He afterward lectured and studied in America, especially in physiology. He soon returned to France, however, where he continued his medical work. Brown-Séquard demonstrated that the decussation of the sensory conductors is in the cord itself; and he has the reputation of having created the physiology of the sensory tract of the spinal cord. His experiments on the transfusion of the blood are also of interest. He also claimed to have discovered the "elixir of life," composed of an emulsion of the seminal glands of the sheep, which was used hypodermically. This somewhat fanciful experiment caused great excitement throughout the civilized world, but "the great expectations" were never realized.

Edouard S. Seguin (1812-1880), born in France, studied medicine and surgery under Itard, and became noted as an educator of idiotic children. He was very successful in his chosen field. A masterly treatise on the subject was published by Seguin, entitled "Traitement Moral, Hygiène et Education des Idiots et des Autres Enfants Arriérés," which has always been the standard text-book on the subject. Seguin also wrote other treatises on Idiocy, which were well received by his confreres. A work

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on "Medical Thermometry" gained great favor among the medical fraternity; as did the physiological thermometer, which he invented, and which is in use among physicians of the present time.

BACTERIOLOGY.

Louis Pasteur, born at Dôle, in France, 1822, took his medical degree in 1847. He gained great fame in molecular chemistry, physical science, and bacteriology. In the province of fermentation and the germ theory he has achieved important results. His investigations into silk-worm disease, pebrine, and its cure, have proved of signal service. His discovery of bacteria as the cause of anthrax (splenic fever) in cattle was an epoch in the science of the disease. Similar results were obtained in regard to fowl cholera; and his experiments show success in preventing the various diseases caused by septic bacteria, by inoculating animals with a milder form of the disease by means of a weaker brood of bacteria, artifically cultured. In 1883 he studied cholera in Egypt with great zeal and energy. His name is probably best remembered as originating a cure by inoculation of the dread disease of hydrophobia. To Pasteur should be given the credit for furnishing the first reliable data from which the modern science of Bacteriology has been evolved and his discoveries marked an epoch in medicine.

FOUR GREAT SURGEONS.

Bernhard von Langenbeck, born in Germany, 1810, was a celebrated surgeon, who gained great fame through his skill and success in the operation for harelip, as well as in the replacement of noses, eyelids, and lips. He likewise gained a reputation by means of the operation of resection in which the diseased bone or injured joint is resected and the diseased part is removed. This operation Langenbeck executed with such ability and success, that many times a limb was saved, which previously was invariably sacrificed by amputation.

Theodore Billroth, probably the most celebrated of German surgeons, was born in the year 1829 and died in 1894. After his graduation in medicine, he became an assistant of Bernhard von Langenbeck; at the age of 31 years he was called to the chair of surgery at the University of Zurich; and from there he was appointed to the chair of surgery at the University of Vienna at the age of 37. Billroth represented the pathological ideal of the sur-

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geon. He was one of the first to study the relationship of bacteria to wound-healing and to septic processes. He studied the reaction of the tissues to infectious agents. He labored assiduously over the minute and gross anatomy of the neoplasms, and later wrote a classical work on tumors of the breast. His practical surgical work on the stomach in the form of pylorectomy gave him a world-wide reputation. His book on "Surgical Pathology" was for many years a text-book even in American schools of medicine, and is still highly prized by surgeons. I remember that I enlarged about a hundred of the drawings in his text-book on surgical pathology, which were used by a lecturer on surgery in one of the medical schools of the West about the year 1880. However, Billroth's monumental work was the "Deutsche Chirurgie," a series of monographs by German writers.

The introduction of Billroth's "Surgical Pathology" is well worthy of your attention, as a historical sketch of surgery, and also as a good description of the obligations of the medical student who wishes to make a special study of surgery. Among other good things said by Billroth is the following. "The surgeon can only judge safely and correctly of the state of his patient when he is at the same time a physician."

Pean was a French surgeon and the contemporary of Billroth. He was, no doubt, the last of the great surgeons who put all their faith in manual skill, and had but little faith in anything else. As an operator in all branches of surgery, Pean probably has never been excelled at any time in the history of surgery. Whilst Billroth represented the pathological, Pean was the anatomical and mechanical ideal of surgery.

Johann Friedrich August Esmarch, born in Germany, 1823, is considered an authority on gunshot wounds, and has gained great renown as a military surgeon by means of his valuable improvements in the ambulances and the ambulance corps used by armies in battle, as well as in the barracks in which the soldiers live during the times of peace. Esmarch is the inventor of the bloodless method of operating on the extremities, which he combined with modern antiseptic and aseptic methods, as they are in use even to-day. Esmarch is the author of many valuable articles and books on surgical topics.

FOUR GREAT PHYSICIANS.

Hermann Nothnagel, born in Austria, 1841, is a celebrated physician of modern times. In 1865 he was appointed Leyden's

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assistant at Koenigsberg, and in 1870 he published his celebrated work, "Handbuch der Arzneimittellehre." In 1894 he began the editing of his great "Special Pathology." Said Nothnagel in a lecture on the subject of the *all-around-training* of a practicing physician:—"There is no doubt that the tendency towards specialization in practical medicine is beneficial in the main, because it makes a more thorough study of a special subject possible; it may even be indispensable for the performance of certain technical operations; but this much may be expected from the practicing physician, that he should know enough of the so-called specialties at least to enable him to make a diagnosis and read the indications."

Robert Koch, born in Germany, 1843, graduated at the age of 23 years. Koch is the discoverer of the contagium of splenic fever, of the bacillus tuberculosis, etc. Koch and his supporters claim that each disease is caused by a specific micro-organism. For some six years after he graduated, Koch labored as an assistant in an obscure hospital, and in 1872 he finally succeeded in getting an appointment at Wollstein, where he continued to labor and study for seven years. It may be readily comprehended that Koch had ample time to prepare himself for his great success in the medical world, and that no success is possible without great labor and continued efforts to prepare oneself by arduous studies and never-ending toil for the duties of life to come later on.

The history and personality of *Kussmaul* must be of special interest to the practitioner of medicine, because it is said of Kussmaul that he brought order, law, and system into a mass of isolated facts. He received his degree in medicine from the institution at Heidelberg in 1855, and then he followed a course of clinical study at Vienna with those two great masters, Rokitansky and Skoda. In 1860 Kussmaul published his first important work—an exhaustive article on epilepsy, which stands even to-day as a classic. In 1863 he accepted the chair of clinical medicine at the institution at Freiburg, where he labored assiduously for seven years and made many important contributions to medical science.

Kussmaul guided the efforts of his pupils in such a way that he stimulated each to make the most of his powers; as Edinger says, he taught his pupils to think, to work, and to write, so that

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the achievements of the German clinicians as investigators, thinkers, and writers are due in no small part to the influence of Kussmaul. Part of his work was the investigation into the diseases of the arteries and their classification into systemized groups, with clear instruction as to their essential characteristics, their symptoms, and the methods of their treatment. He also gave a clear description of diabetes. He was the first to introduce the use of the stomach pump; he first showed how bismuth should be given in gastro-intestinal diseases; he first practiced thoracentesis for the withdrawal of fluid from the serous cavities; and it is due to him that the German nation passed the stringent vaccination laws which are responsible for the present rarity of smallpox in Germany. Kussmaul died in 1902.

Rudolph Virchow, the father of modern cellular pathology, was born in 1821, in Pomerania, and received his medical degree at the University of Berlin in 1843. He lived to witness the greatest improvements in medicine of all time, the greater part of which he either made himself or at least helped to discover. In the year 1902 he died with the knowledge of having lived a useful life. "Whatever, outside of a cell, acts upon it," wrote Virchow, "works a mechanical or chemical change within it, which change is disorder or disease." This new knowledge completely changed conceptions of disease and made plain one of the foundations upon which it depended. It made possible the marvelous progress of the last few decades of the nineteenth century. Virchow is one of the masters of medicine, whose name must always be counted among the immortals.

In 1858 Virchow instituted the doctrine or theory known as "Modern Vitalism," which, in fact, was borrowed from natural scientific medicine and distinguished from the vitalism of the previous century in that it breaks up the vital force, which was supposed to be either distributed throughout the entire body or located in a few organs, into an indefinite number of associate forces working harmoniously, and assigns to them all the final elementary principle without microscopic seat. "Every animal principle has a sum of vital unities, each of which bears all the characteristics of life. The characteristics and unities of life cannot be found in any determinate point of a higher organism, *e. g.,* in the brain, but only in the definite, ever-recurring arrangement of each element present; hence it results that the composition of a large body amounts to a kind of social arrange-

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ment, in which each one of the movements of the individual existence is dependent on the others, but in such a way that each cell has an activity of its own, and that each, although it receives the impulse to its own activity from other parts, still itself performs its own function." This is nothing but another way of expressing the cell-doctrine, to which many medical men are now committed, which means that all bodies are built up of cells and that each cell has a unity and a purpose of its own.

Time alone can decide as to the ultimate validity of Virchow's cellular pathology. An important feature in which the cellular pathology differs from other systems, and particularly from the old humoral pathology, is the doctrine that the blood itself is not the proper and original cause of dyscrasiæ and not the cause of continuous alterations of the tissues; that the dyscrasiæ arise because the blood is not an independent structure, but dependent upon the condition of the patient in consequence of its continuous conveyance of the noxious material from all parts of the body,—the blood is, therefore, merely the medium for the production of the dyscrasiæ. This theory has made several peculiar, new, and symptomatic or morphological forms of disease, such as leukæmia, leucocytosis, and what is popularly called pernicious anæmia. Virchow also cleared up the old and obscure ideas regarding pyæmia, and proved that an absorption of pus into the blood, which the name implies, is quite impossible; likewise, that pyæmia is inseparable from thrombosis.

Perhaps Virchow's greatest material monument is the Pathological Institute and Museum in Berlin, erected by the Government in accordance with his desires. It contained 23,000 specimens at the time of his death, and by far surpasses all similar collections in the world.

THE GERM THEORY.

The new theory of the cause of diseases, based on the results of the microscopical study of germs, the germ theory, stands in the closest possible relation with the doctrine of spontaneous generation, fermentation, miasm, and contagion. The germ theory of disease had its advocates two and a half centuries ago, which goes to show that the growth of any science is slow, and that a great number of workers take part in the gradual evolution of what perhaps a few get credit for by their skill in summing up the knowledge gathered by their predecessors. However, a good history of the germ theory can only be written after it has reached a sound basis.

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THE DEVELOPMENT OF ANIMAL PHYSIOLOGY.

(*Continued.*)

By John C. Cardwell, M.D.,

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VI.

SOME PHYSIOLOGIC CONCEPTS OF THEOPHRASTUS.

WHEN having been accused of impiety, Aristotle finally retired from Athens to his country house at Chalcis, his duties as head of the Lyceum were assumed by his favorite pupil, Theophrastus of Ephesus. And upon the death of Aristotle, about a year later, Theophrastus became not only his successor at the school, but custodian of his writings, his library and other personal property, and guardian of his children as well.

Born about 372 B. C., Theophrastus had acquired some preliminary training in philosophy in his native island, Lesbos, and had studied under Plato for a number of years before joining the Peripatetic School, which was not really founded until after Plato's death. He remained head of the school from about 322 B. C. until his death, about 288 B. C.,[1] and devoted a large share of his life-energy to the elucidation and elaboration of the Aristotelian system of philosophy. But he was no mere imitator nor blind follower of Aristotle, for though he suggested no radical changes in the fundamental principles of the system, he critically re-examined several of its basal tenets and made extensive matter-of-fact additions to it.

His main viewpoint was philosophic, but he was a naturalist as well as a philosopher and showed strong predilection for scientific investigation. Like Aristotle he insisted that sound knowledge of nature must be built upon experience; and his two great treatises on plants[2] have come to occupy as prominent a place in the history of botany as have the two chief works of Aristotle on animals in the history of zoölogy.

His writings were originally quite numerous and dealt with nearly all departments of the science and philosophy of his time; but only a few incomplete general treatises together with a number of fragments of works on special subjects have come down

[1] Each of the three dates given is approximate merely.

[2] *Περὶ φυτῶν ἱστορίας* and *Περὶ φυτῶν αἰτιῶν.*

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to us. Of the former the two treatises on plants are really remarkable works, contain abundant evidence of his scientific bent and ability, and afford some insight into his general biologic concepts. But of greater interest to the student of the history of animal physiology are the fragments dealing with sweat and sweating, vertigo, swooning, lassitude, suffocation, palsy, and odor. Of these the writer has, unfortunately, had access to but one in the original,[3] and for the remainder has been forced to rely upon secondary sources; such as the digests of Gruner, the references in the works of Galen, and the brief accounts in modern works on the history of philosophy and of medicine.

Theophrastus undoubtedly recognized, as had several of his predecessors, fundamental general resemblances between animals and plants. He taught that all life, whether vegetable or animal, is primarily dependent upon natural body-heat and body-moisture, but pointed out the necessity of certain environmental conditions—such as supplies of air, sunlight and food—for the maintenance of life. He taught also that though the phenomena exhibited by living individuals are manifestations of a contained and constituent life-power, the soul, the individual animal or plant is, after all, but an instrument through which natural causes act toward an end, though that end may not be, and is not, apparent in every particular case; thus endorsing and re-stating in his own way, the two principles which had been formulated and designated by Aristotle as the *formal* and *final* cause, respectively, of animate existence.

He seems also to have discerned essential resemblances between living and non-living things, for though he recognized distinguishing characters he nevertheless declined to formulate any absolute distinctions between these two great classes. He was forced, therefore, to admit, on logical grounds, the possibility, or even probability, of generation *de novo,* and probably entertained upon this, which was, even then, an old and oft-reiterated question, views somewhat similar to those of Aristotle. But he significantly cautioned against over-ready admission of generation *de novo* in particular instances, remarking that in the case of plants, *apparently* spontaneously generated individuals may have *really* developed from seeds which, because of their minuteness, had escaped observation, or which had been transported "by

[3] The fragments dealing with vertigo as reprinted, with commentary, in the works of Ballonius (1).

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winds, water and birds to places" quite remote from the parent plant and "where we least expect to find them."[4]

His discussion of the nature and causes of perspiration is very interesting. He either imagined or inferred the continual exudation through the skin of an insensible vapor which, he pointed out, should not be confounded with the occasionally appearing liquid sweat, though the latter might be due in part to condensation of the former. He looked upon liquid sweat as a true excretion, its constituents being substances which, like the constituents of urine and feces, are nutritionally useless or even detrimental to the body. It is excreted upon occasion only, he said, because these substances find their natural exit from the body in urine and feces. If, however, the body contains more of such substances than can be excreted by the natural channels, the skin is called upon to aid in their elimination. Such being the case it is easy to understand why those who pass large quantities of urine and of semi-liquid feces sweat but little and rarely, while those who pass little or no urine sweat frequently and profusely. He discussed also the effects of environment, age, general body-states, the quantity and quality of food and other circumstances, on the amount and sense-qualities of liquid sweat. Physical exertion, moderate warmth, large quantities of liquid ingesta, laxness of the blood-vessels and patency of the skin pores favor sweating, while excessive heat or cold, dryness of the body in general and of the skin in particular, compactness of skin-structure, and the contact of water with the skin retard sweating. Those who sweat frequently are more readily induced to sweat than are those who sweat but rarely, because in the case of the former the skin-pores are kept open by frequent use. Physical exercise is especially favorable to sweating because it produces laxness of the blood-vessels and openness of the skin-pores; but the sweating is not so marked during as after the cessation of physical exercise, for it is then that the relaxed state of the vessels and skin is most marked. After running or other physical work in the shade, one sweats more profusely than after similar exertion in the sun, because the sun's heat dries the skin and closes its pores. The greater frequency of sweating during summer than winter may be accounted for, he thought, by the warmth and the greater amount of liquid and moisture partaken of during the summer; yet, he said, some seem to sweat more

[4] 8: vol. ii, pp. 388-90.

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in winter than in summer. That minors, and especially young children, do not sweat so readily as do adults may seem contradictory because, considering the warmth and moisture of their bodies, one would naturally expect them to sweat more readily. But the skin of the young is compact, its pores not freely open, and their natural body-heat is used up largely in the processes of nutrition and growth, leaving comparatively little for the generation of sweat; and it should also be remembered that relatively larger amounts of moisture and waste-material are excreted in the feces of children than in those of adults, the former being, as a rule, more moist and relatively more copious than the latter. Sweating, he said, is more marked during sleep than during waking repose, and the moribund are frequently bathed in profuse perspiration. He noted, too, the more frequent appearance of sweat on the skin of certain portions of the body than on that of other portions, and asserted that the skin of the face, especially of the forehead, sweats very readily because the head is very moist and flaccid. The saltiness, acridity, and malodorousness of some sweat he attributed to faulty or incomplete concoction within the body, due to uncleanness of the intestine, or to some abnormal general state of the body. When the feet are immersed in water they do not sweat so freely as do the supernatant body-parts, for water in contact with the skin retards sweating. Certain substances in the food—such as rue—cause the sweat to be malodorous. Those who are ill are apt to sweat readily and their sweat is apt to be very salty and foul-smelling. Sweat may be warm or cold according to the degree of its concoction. The sweat which first appears upon the skin is thin and very watery, while that which appears later and comes from the inner-body parts is of thicker consistency. The impurities which are excreted in sweat may be so excessive as to cause eruptions, and sweat may even be bloody, as the physician Monas[5] has certified.[6]

In another fragment, lassitude or fatigue is discussed. Those who are tired, he said, feel a heaviness in certain body-parts, and especially in those limbs which have borne the brunt of the work. This sensation is especially distinct in the joints because

[5] The writer has not been able to identify the physician here referred to.

[6] Compare all assertions made in the above paragraph with Gruner's digest. 4: vol. 2, pp. 582-592.

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during movement there occurs an afflux of liquid or moisture to the joints from other parts. Some contend, however, that the feeling of heaviness is apparent in the flesh, bones and even throughout the entire body, and have given a special name (*'οσα'γρας*) to bone-weariness. Weariness seems to be due to the taking up of moisture, or of some humor, by the fatigued parts; its actual seat is, however, an open question and may be, as Epigenes declared, in the vessels and *neura*, or in the *neura* merely.[7]

That he had no clear conception of nerves as distinct from blood-vessels and tendons is quite obvious from what he said concerning palsy. He ascribed the "falling asleep" of the foot from pressure to an interference with the natural movement of the *pneuma* and consequent chilling and stagnation of the blood and moisture in the part. And he considered palsy to be similarly caused; to frequently result, in fact, from a chilling or cold.[7]

Swooning (*λειποψυχί'α*) he ascribed to either defective body-heat or to a chilling of the body. It may result from either marked cold or great heat; in the former case its genesis is apparent; in the latter, it is probably due to the greater fire overcoming or deadening the lesser. Holding the breath and dashing cold water on the skin so as to close its pores aids recovery from swooning, for by the former the natural cooling effect of respiration on the blood is temporarily suspended, and by the latter the heat which would otherwise escape through the skin is driven back into the body. Very powerful sensations or feelings, whether agreeable or disagreeable, are apt to cause swooning, for both cause an afflux of body juices. He seems to have ascribed suffocation also to some derangement of body-heat.[7]

The causes of vertigo he classified as internal and external. Among the internal he mentioned the ascent of a foreign spirit or humor to the head (meaning evidently the brain or the region about the brain) by way of the veins. It might be an excrementitious humor of the body, some proper virtue of the food—such as the spirit of wine—or some blemish in the juice. Among external causes he mentioned turning about rapidly (spinning), and walking or running round and round in a circular course; and, he asserted, that the smaller the circle, the greater number of laps, and the more rapid the gait, the

[7] *Cf.* 4: vol. 2, pp. 594-98.

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more readily would vertigo result, also that spinning from right to left more readily induces vertigo than from left to right. Gazing at continually moving objects, such as at the running water as seen from the deck of a ship, at very tall, very large, or rapidly vibrating objects, or indeed, fixing the eyes intently and for long on any one object may induce vertigo. But, he contended, whatever the apparent cause, the actual or immediate cause of vertigo is always the same, *viz.*, the stoppage, counteraction or other perturbation of the proper motion of the humors which naturally reside in the head (*i. e.*, in the brain). These humors, he contended, are continuously moving in a definite manner; and when as a result of the ascent to the head, by way of the veins, of a spirit, or humor, foreign to the head, or by circumgyration of the body and head, the natural equilibrium or natural motion of these humors is disturbed, vertigo results, and, if severe enough, the subject may actually be thrown to the ground.[8]

On senses and sense-perception he wrote a work of some value[9] which seems to have formed part of an elaborate treatise on the history of physics.[10] He also wrote a special treatise on odors.[11] He supposed the elements to be odorless and that odor implies mixture or complexity of composition, for fetid odors are characteristic of corruption and putrefaction, while intimately mixed and thoroughly elaborated humors give agreeable odors. He observed that the odor of certain substances—*e. g.*, juniper berries—is communicated to the urine, and that certain very powerful odors may induce swooning. He noted too that many animals possess a more delicate sense of odor than man: and thought that animals find the odors of those substances agreeable which yield them nourishment.[12]

In comparison with Aristotle's encyclopedic accounts, the contributions of Theophrastus (as known to us) seem very meagre. It should not be forgotten, however, that Theophrastus devoted a far greater share of his attention to plants than to animals, while Aristotle seems to have taken greater interest in the study of animals. It is quite probable also that Theophrastus gave general

[8] Cf. 1: vol. i, pp. 271-98.

[9] *Περὶ αἰσθήσεως καὶ αἰσθητῶν.*

[10] *Φυσικὴ ἱστορία. Cf.* 8: vol. ii, p. 354, note 3.

[11] *Περὶ ὀσμῶν.*

[12] 7: vol. i, p. 412.

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endorsement to the physiologic views of Aristotle, and selected for special study only certain questions from among those to which Aristotle had given but little or no attention; his object having been, apparently, the filling up of gaps in the comprehensive system of knowledge to the building of which Aristotle had devoted so many years of his life, but which, after all, he had failed to complete. It should be remembered also that a number of Theophrastus' own writings have been lost, though it is to him that we are primarily indebted for the preservation of the works of Aristotle. Scanty, however, though his contributions to contemporary knowledge of animal life-phenomena seem to have been, they are not lacking in the element of originality.

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SOME POINTS IN THE INTERIOR ARRANGEMENT AND CONSTRUCTION OF A BUILDING FOR A SPECIAL LIBRARY.

By Charles Perry Fisher,

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IT is possible, and quite natural, that on reading the program of this meeting the first impression to many will be that the questions I bring before you for discussion to-day, have already been well sifted and debated before the American Library Association. I wish to state that I have been unable to find direct answers to the points I now submit for your consideration.

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We have as members of this Association, representatives of three Societies which have in recent years erected buildings for the purposes of a society and a medical library. In the order of their construction these are: 1st, the New York Academy of Medicine; 2nd, the Medical Society of the County of Kings; 3d, the Boston Medical Library. How much the last benefited by the experience of the others we hope to learn in the course of the present discussion. While we cannot expect to develop plans for an entire building, the opinions and suggestions recorded in our proceedings of this meeting, should be of material assistance in giving instructions to an architect engaged to prepare plans for a structure of this class.

The first question, "Is it desirable to have the reading-rooms on the first floor?", I should answer in the negative. In a building, say 100x100 feet, with the stacks built apart, as will be mentioned later, it is perfectly feasible to have the entire library equipment on the first floor, with plenty of space for the janitor's office, and apartments for a Directory for Nurses if desired; but I do not think it desirable from an architectural point of view, and less so from a practical standpoint, as there would be always more or less noise and confusion, necessarily accompanying the business of a large building, which would be an annoyance and discomfort to the readers and attendants in the library. A building of the size mentioned above, 100x100 feet, consisting of a basement and three upper stories, should have space reserved in the basement for a receiving-room with a graded outlet, if possible, to the street level, and a storage-room for duplicates. The entire first floor should be assigned to the offices, committee and meeting rooms, etc., of the society. The second floor could contain one large meeting-room or auditorium, and the remainder of the floor space be devoted to the library: one or more reading-rooms; catalogue-room with toilet; office of librarian with toilet, and a committee-room if thought necessary. There should be a book-lift running from the receiving-room in the basement to the catalogue-room. The third floor could be arranged for a banquet hall, kitchen, and such living apartments as are thought desirable. Public toilets should be at least in the basement and upon the second floor.

To the second question, "Is one large reading-room, with gallery containing private rooms for dictation, preferable to two or three smaller rooms?", it is more difficult to give a positive

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answer. A single reading-room, say eighty feet in length, with a high domed or vaulted ceiling and a gallery or mezzanine story on both sides, would certainly be imposing and extremely effective, especially if sufficient funds are available for appropriate decorations. With this plan the office of the librarian, committee-room, etc., would be at one end, with the catalogue-room, etc., above on a mezzanine floor; the rooms so arranged that the receiving-room in the basement, and the catalogue-room on the second floor, would be in line, to permit of the construction of a shaft for the book-lift. The side galleries would contain the private rooms for dictation, or seminar rooms as they are generally termed by architects; but perhaps the following plan, while not quite so effective, would be more desirable:—A main or central reading-room, about forty feet in length without galleries; at one end of this, and communicating, a room thirty or thirty-five feet in length for the current periodicals, with a mezzanine floor containing several rooms for private dictation, and at the other end of the central reading-room, the office of the librarian, catalogue-room, etc.

The third question:—"Is it better to have all the book stacks in one place, built to permit of horizontal as well as vertical expansion, according to space, or to divide them?" For the special library it would perhaps seem more convenient to have all the stacks in one apartment; but I can see no objection to dividing them; in fact, if the additional expense is not considered, I would rather favor it; using one part exclusively for periodical publications and the other for books. In either case, according to my idea, the stacks should have their own building, four walls and a roof, with one wing if all the stacks are to be kept together, or two wings if they are to be divided, communicating with the main building on the basement and library floors by short vestibules having fire-proof doors at both sides. The stacks should be built on foundations at the basement level, and rise tier upon tier, of a height of not more than 7 feet 6 inches each, until the desired amount of shelf room has been obtained. No wall stacks should be allowed. This plan, if the walls are properly constructed, would reduce the danger from fire, with the accompanying destructive flooding by water, to a minimum. The Library Bureau gives, as an estimate, about 20,000 volumes to the tier of stacks on a floor space 45x25 feet. My estimate for this space would make 15,000 volumes the limit.

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If the stacks are in a separate building, or, it might be advisable to call it either a wing, or pavilion, one of the most difficult problems the architect has to contend with in the construction of his plans is eliminated. The size of the main building and of the wing or wings for the stacks would, of course, be arranged according to the dimensions of the lot. The fact of the stacks being separate ought not to detract from appearance of the building as a whole; the shape and decorations of the outer walls would depend entirely upon the taste of the architect.

The fourth and last question:—"Is it preferable to have the stacks built with a uniform width of shelving, say ten inches, so as to permit keeping all books of a class together (folios proper not considered, as they are kept apart in any case), or, secondly, to follow the old plan of the lower shelves 12 inches and the upper 8 inches wide; or, thirdly, to have one or more sections with shelving twelve inches wide at the end of each row of stacks composed of eight inch shelving?" These questions I have had under consideration for some years and am strongly in favor of stacks with a uniform depth of shelving of from ten to eleven inches in the clear, for a medical library. From the information I have obtained the additional cost would be so small that if a quantity of stacks are ordered at one time, it need not be taken into consideration; the amount of floor space occupied, and the width of aisles, would be practically the same as with the old style stacks, having twelve-inch shelves below and eight-inch shelves above. Formerly the books of a library, in a great measure, were arranged for appearance; duodecimos, octavos and quartos being lined up in each case; small books at the top and large at the bottom. I can well remember the shocked appearance of one of the members of the Library Committee of the College of Physicians when the present system of classification was introduced and the symmetry of the shelf line destroyed. My idea would certainly increase the irregularity of size as far as books are concerned, but would also greatly increase the utility of the stacks in the modern arrangement of a library by classes, bringing all of a kind together with the very few exceptions of large folios, which, for their proper care and preservation, should be kept on the flat, in cases or stacks with roller shelves.

The loss in vertical space would not be so great as at first imagined; if the stacks are seven feet high with the lower shelves twelve inches, and the upper eight inches deep, six shelves to a

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section is perhaps a fair average; the two lower shelves will accommodate books from twelve to fourteen inches high, and the four upper shelves, books of the ordinary octavo size; if you get beyond fourteen inches on the lower shelves, then one shelf is lost in that section: again, especially with journals and transactions, it is possible to run the octavo size from the top to the bottom of a section and gain an additional shelf, so, as I have said, I believe six shelves to the section should be taken as a fair average. If the width of shelving I have suggested is used throughout and the books classified without regard to size (with the exception of folios, already noted), there would be practically no loss of shelf room in the arrangement of the journals, reports, transactions and dissertations, which form more than one-half of most medical libraries, while the loss in shelf room for the books would probably be one-sixth, which might be somewhat decreased if the stacks were seven feet six inches high, instead of seven feet.

I quote the following from letters received in 1903, in reply to my request for an opinion in regard to the desirability of building stacks with the shelves of sufficient width to accommodate books of all sizes except folios:

1. Library, Surgeon General's Office—"It seems to us that the advantage * * * is more than counterbalanced by the loss of vertical space in keeping quarto journals with the octavos, and that the present arrangement of having the lower shelves of extra depth is, on the whole, the best. The additional expense of constructing the shelves with a depth of ten inches, and the additional strain upon the floor are not considered very important, but it is likely that this library, when constructing new shelving, will follow the present arrangement."

2. Dr. John S. Billings, Director, New York Public Library—"The arrangement which I have made for the stacks in the new library building are that a considerable majority are eight inches deep from the bottom to the top of the stacks and at each end of the stacks are three sets of stacks which are twelve inches deep. I should advise the carrying out of the same plan with regard to the new stacks for your new building, only the proportion of wider shelves should be greater than that above mentioned."

3. Mr. John S. Brownne, Librarian, New York Academy of Medicine—"I have experienced the same trouble that you have in regard to the alphabetical arrangement of journals, etc.

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* * * I would go further than you go and make the size twelve inches deep throughout. You would only take up an additional half inch on the floor space. * * * I agree with you in regard to the convenience, it would outweigh the additional expense, weight and space."

4. Mr. Albert T. Huntington, Librarian, Medical Society County of Kings—"Were I designing a stack-room I would not make all the shelves the same width (ten inches deep you suggest). There will always be large quartos and folios which you cannot place in their proper order even on a shelf ten inches deep. * * * If you plan to place quartos and folios on the same shelves with octavos and duodecimos it also necessitates leaving a very much greater space between shelves. You may have one quarto on a shelf twelve inches high and all other books on the same shelf may not be more than 8 or 9 inches high; * * * if you carry the same plan through the whole library there is an enormous amount of waste space. For instance, you will be able to put only five shelves in a section where seven might go. If, instead of adjusting your shelves to a uniform height, you adjust each individual shelf to the requirement of the books it holds, you will find that the consequent irregularity will cause your stack-room to present a very ragged appearance. Personally, I find no objection to running a quarto series under the octavo series. The ratio of two quarto shelves to five octavo shelves will run pretty evenly throughout the library."

5. Dr. Edwin H. Brigham, Boston Medical Library—"Our shelves in the stacks are of two widths, 7 inches and 11 inches, but you may add an inch because of the strong iron standard to which they hook in * * * we put wide and narrow shelves as we want them, but practically the wide on the lower half. Shelve all our folio and quarto journals on the first floor just off the reading room as a matter of convenience, thereby breaking the alphabetical sequence."

It will be seen from these replies that there is a difference of opinion in regard to the best form of building book-stacks, and the subject is a proper one for discussion. If it were simply a question of economy in shelf room, then I believe the plan of Dr. Billings to be the best; but if a question considered as a part of the modern advancement in library arrangement and classification, especially with the scientific library, then I think my suggestion worthy of favorable consideration.

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JAMES READ CHADWICK, M.D.
1844-1905.

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In Memoriam.

JAMES READ CHADWICK, M.D.

A BRIEF SKETCH OF HIS LIFE.

ON September 23, 1905, medical librarians, as well as the medical profession, lost a devoted friend and earnest co-worker in the sudden death of Dr. James Read Chadwick. His body was found outside his summer residence at Chocorua, N. H., by one of his servants, and it is believed that while suddenly taken ill during the night he went out upon the piazza roof to obtain fresh air, was seized with a fainting spell, and fell to the ground.

Dr. Chadwick, was born in Boston, November 2, 1844, the son of the late Christopher Chadwick, a Boston merchant, who married a daughter of the late James Read. Educated in the Boston schools, Dr. Chadwick was graduated at Harvard College with the Class of 1865 and from the Harvard Medical School in 1871. Marrying in that year Miss Katharine M. Lyman, daughter of the late Dr. George H. Lyman, he took his wife to Europe and pursued his medical studies in Berlin, Vienna, Paris and London. On his return to Boston, in 1873, he began the practice of his specialty, gynecology, in which he soon gained high distinction. He was largely instrumental in the founding of the American Gynecological Society, which was formed in 1876, and was its secretary and the guiding spirit in its affairs for the first six years of its existence; in 1897 he was elected its president and had the gratification of seeing upon its roll of members the names of the most prominent gynecologists in America.

Dr. Chadwick was an ardent booklover and was really the founder of the Boston Medical Library, in 1875. From its inception he was the librarian, and up to the day of his death his enthusiastic efforts in its behalf were unflagging, while medical libraries throughout the country owe a great debt to his pioneer service in this field of work.

He was one of the organizers of the Harvard Medical Alumni Association in 1891, and its president until 1894. In 1904, he was elected president of the Association of Medical Librarians and declined a renomination to the office for 1905, which was unanimously tendered to him, but was a member of the executive

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committee at the time of his death. He was also a life member of the American Library Association.

His contributions to literature were numerous, mainly on the topics of gynecology, medical libraries, cremation, and genealogy. He was a ready and finished public speaker and made numerous addresses in various parts of the country on the subjects which interested him most.

A man of varied tastes, broad-minded and singularly free from narrow prejudice, his strong personality inspired the trust and confidence of his patients, and his frequent acts of kindness to the poor would, if generally known, have won for him the admiration of all. Personally, Dr. Chadwick was a rare combination of modern energy and old-fashioned courtesy. He was a delightful host, a clever conversationalist, generous to a fault, and, on account of a certain spontaneity of manner, seemed younger than his years. His genial presence and energetic personality will be missed by his friends in many circles, and in many places and in many ways the cessation of his activity will be felt most keenly. He is survived by a son and three daughters.

A TRIBUTE TO THE MEMORY OF DR. JAMES READ CHADWICK.

EXCERPTED FROM THE THIRTIETH ANNUAL REPORT OF THE BOSTON MEDICAL LIBRARY.

By John W. Farlow, M.D.

OUR thoughts, in this Thirtieth Report, are always turning back to the memory and services of the one who wrote the other twenty-nine, who was instrumental in starting this Society, and who, more than any one else, contributed to its progress by his interest, knowledge, tenacity of purpose, and particularly by his enthusiasm. The story of the Library is practically the story of his activity.

For some time after the Library was established, the books, as they were received, were placed on the shelves, without special arrangement, and Dr. Brigham had to trust to his memory in getting the books when called for.

This was before the starting of the *Index Catalogue*. During the winter of 1879-80, Dr. Chadwick brought to the attention of the Committee, the necessity of having the books properly

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arranged and catalogued, and he spent a great deal of his time and thought on this subject of proper classification, even up to the time of his death.

As to the sources from which he gathered so many books and journals, he had a wonderful faculty for ascertaining and never forgetting where the desired volumes were to be found. He had also a most persuasive way of appealing to the generosity, and inciting the interest of members of the profession and others as well, in connection with his desires for the Library, whether books, pamphlets, autographs, paintings or photographs.

Through his long friendship with Dr. Billings and Dr. Fletcher, he secured large numbers of books and periodicals, which we much needed, and in return sent to Washington numerous boxes of what was of value to the Surgeon General.

Nearly all of the manual labor of looking over, selecting and making ready this great amount of material was done by Dr. Chadwick, alone. I well remember several years ago, spending nearly all day with him in the basement of the Surgeon General's Library, in Washington, overhauling great piles of journals, climbing on shelves, standing on step-ladders, selecting from among the dusty journals what might be needed for our own collections. This sort of work he had done alone several times a year, for twenty years.

He established most friendly relations with other medical libraries, but his gifts far exceeded what he received in return. In his last annual report he stated that 101 large boxes of periodicals and some books had thus been distributed by him.

The picking out, laying aside, according to want-lists, this enormous number of periodicals, was, to a very large extent, his own work. These boxes were sent to Portland, Me., and Portland, Ore., to Concord, N. H., St. Paul, Minn., Chicago, San Francisco, Seattle, Baltimore, Montreal, and many other libraries. The successful starting of medical libraries in many of the smaller cities, especially in New England, is due, in a large measure, to his advice and help, and particularly to his large-hearted generosity in the contribution to their scantily filled shelves of books and periodicals, which he never wearied in choosing for them according to their various needs.

When we moved from Boylston Place to this building, an immense number of journals, most of them duplicates, which had been stored in Jamaica Plain, Forest Hills, and other places, were

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brought here and deposited in the basement, filling three rooms from floor to ceiling. The separation of these thousands of journals according to language, country, subject, year, and then in chronological order, the taking out of what was needed for our own files and the proper disposal of the remainder was the work of about three years, and here Dr. Chadwick was found several hours a day, nearly every day, including holidays and Sundays, and often also in the evening.

What he accomplished, and with what labor, is probably known to but few of you, but it made a great impression upon me.

In 1877, when I was a medical student, I helped him, in a very small way, to arrange the books and periodicals then beginning to accumulate in the rooms in Hamilton Place. Twenty-five years later I saw in him the same intense interest, the readiness to work, the contagious enthusiasm, and I wondered how many men of 60 years were as eager to work, mentally and physically, as they were at 35.

He lived to see the medical books and periodicals of the Boston Athenæum, Harvard College, the Tiedemann Library and the Boston Public Library deposited in this Library, which he had hoped would be the Academy of Medicine, the medical center of Greater Boston, even of New England.

When we look about in this building for the room reserved for his use, for his desk, for anything pertaining to him alone, we find—nothing. There is no Librarian's room, he has no desk, no closet, no drawer, merely a small wire basket in one corner of a shelf in the cataloguer's room, in which were placed various memoranda, old catalogues, and odds and ends.

The whole library building was his field of action, he was no sedentary bookworm, but a worker and inciter to work, as the Library staff will testify from long years of personal knowledge. And yet, during these years, he was in active medical practice, and a frequent contributor to medical and other literature.

In trying to define what the duties of the Librarian of the Boston Medical Library are, in the light of what was done for thirty years by Dr. Chadwick, it seems impossible to set any limit as to time or amount or variety of work. The standard set by him was too high, his energy and enthusiasm too great, and the work of his successors must fall far short of what the members of this Society are accustomed to expect.

The Boston Medical Library has lost its best friend.

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MEMORIAL REMARKS ON DR. JAMES READ CHADWICK.

By Clarence J. Blake, M.D.

TO paint the portrait of a friend in color, to see each habit, thought, sentiment, each quick emotion, and permanently set them, all admixed, in due proportion joined, is a transcendent art.

To try to paint the portrait of a friend in words, whose color tone only by juxtaposing blends, bespeaks indulgence.

The broad rather than the deep classification of our fellowmen is the one most apt to pass current with us, partly because the majority of our human relationships are no more penetrant than is necessary to the conservation of the social balance, and partly because, in every man at all earnest in his sense of responsibility, the inner center of motive is exhibited only in its output.

That the personality of an individual should have an important bearing upon the character and application of this output is a reason for giving it consideration, and this is especially important when the personality is so marked as to make it not only potentially influential but, in its concrete, utilizable as a working tool.

Of James Read Chadwick it may be said that his personality, as exhibited in his relations with his human kind, was an effective part of the equipment by means of which he achieved that which he undertook, and also, that its effectiveness was a basis of the persistence with which he followed any undertaking for good.

Artistic in temperament, generous, kindly and sympathetic, yet sufficiently combative, when needful, and when there was a fair ground to fight upon, his hold upon people who came near enough to really know him is evidenced, as well in the personal letters concerning him written since his death, as in the impulse given in the organizations with which he was associated, and the ends attained in which his personal influence, and personal example in work, were motive powers.

Essentially a medievalist in his tastes, with a strong sense of the joy of living and equally strong joy in the labor of accomplishment, as strikingly individual in his habit of thought as in his habit of dress, the picture of him as we call it to

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mind, is that of a cavalier, or of a knight errant on single quest, whose mission was rather to succor, to comfort and to uplift, than to fight and vanquish.

Had he lived in the time of Charles the First, a cavalier he certainly would have been, though there were not altogether wanting in him those serious and pragmatical characteristics making, in the Round Heads, the background against which we more brilliantly limn the men who could lighten the passage of a waning cause with sword and song together.

His sense of humor, his lightheartedness, his raillery were the silken shoulder-cloak beneath which he wore his shirt of mail—flexible, and but hardly penetrable. On ground that he believed, or pretended to believe, to be firm, he was no mean controversialist and the blade of his wit hung, not in a clinging scabbard, but in a hip knot, and was quick in lunge and ready in recover; in the very mien and carriage of him, on such occasions, there was that which runs between the lines of one of his later favorite poets, "The sweet sound of steel upon steel in the joyous passage of arms at Ashby."

If the dress, simple but unconventional, set forth the man, so also did his chosen surroundings, the office in which he received his patients, alone—never, though thereto urged, in the presence of an office nurse, because as he said, his patients were entitled to a privileged communication—seemed quite as much a library or a museum as an office; the spaces between the windows, and the walls, where not hung with sketches, portraits, and curios, were covered with books; the single table heaped with manuscripts and letters, from which complex mass, after due stirring, any desired communication, recognized by a protruding corner, would be seized, withdrawn and submitted to perusal; he rarely failed to find a wished-for paper, though the memorizing process by which it was located might well be a source of wonder, and seemed to enjoy in preference to the more orderly pigeonholing of documents, an apparent disorder, akin to "sweet dis-array," which comported with the disarrangement of the books upon the shelves whose seemingly careless or unfelicitous groupings had a reason in the relations of contained passages to the complex of which he held the mental key.

It was a place in which to sit cosily of an evening, between lamplight and firelight, with comrades, or with the silent com-

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panionship of books and writing work, as the late glow of his windows often testified, and the very furniture of the room bespoke its hospitality, the chairs were so easy to slip into and so very hard to get out of.

An omnivorous reader, he was well calculated to be the founder of a library, and though for some years a sufferer from physical ills, his courage was untouched, his cheerfulness undimmed, and his hospitality unabated.

Of the professional work done in that office, the personal testimonials are many, not merely work in his especial line of service, but in the broader sociological field which is the opportunity of every physician. "I never," said a good woman whose daily life carried her much among the needy of her sex, "took a poor girl to Dr. Chadwick that he did not give to her his personal attention and to me help in what I had to do for her." It was a place to carry perplexities and sorrows, and another woman whose way was set with many thorny places, said, "As I look back over the thirty years of his friendship I can truthfully say it was one of the greatest blessings of my life."

Here, too, centered that solace which each man for himself in some form needs, in being or in thought; for home, whether in the house, in town or in the summer resting-place, whose shady, up-hill road tempted the hidden wayfarer, meant much to Dr. Chadwick; here, as in his larger human contact, his ability to meet suggestions was apparent, and his children said, "He was as young as any of us."

This ability, expressed through his responsive versatility, enabled him, while pivoted upon his own center of thought, to return quickly to any magnetic point upon the horizon, like the needle of a compass, or to swerve toward it, like the versatile anther of a flower, and did much toward the making of those varied friendships which he enjoyed, and through which he sought to serve, and which were all instinct, on his part, with a happiness in being helpful.

Through this combination of versatility and constancy he was led to ignore the lesser qualities in his new found friends and to point straightly at that which made for distinction, while his generosity was exemplified in his ready recognition of a new thought, a new idea, or a new purpose, and his warmth in welcoming it was equalled by his frankness in bespeaking its credit or furthering its development.

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The pleasure with which he unearthed a book that might be made the nucleus of a collection, and that recognizing a trait of character, his hold on which might mean the saving of an individual life to better uses, came from the same cheerful, hopeful, and unfailing source; the sorrows that he lightened, the entanglements that he helped to unravel, the paths that he sought to make straight, are a part of his professional confidences, some of them are known to some of us and we are glad of the knowledge.

To his collaborators, and especially to young men and young women entering the medical profession, he was most generous of his time, of his judgment, and of more material help, outputs which find no written record, but are to be passed on, with the memory of his personality, in the lives of others. That he was not only willing but eager to help within his powers has been abundantly evidenced, and the very last occasion of his visit to Chocorua, where he met his death, was the freeing from difficulty of a patient, and the provision for her maintenance during the remainder of her life. After an evening passed in working with his lawyer toward the fulfilment of this purpose, he said, "Now that is done, let us have some music and go to bed," and so went to his rest and was seen alive no more.

That he was beloved by those who knew him, as patients, dependents or associates was the fruit, not only of his personality, but of its unvaried constancy as well, a persistent trait which has enabled one who worked with him for thirty years to say, "He was always the same, always bright and cheery, and always with a new story or an old quotation to lighten the labors of the day."

To make such a personality effective it must have one quality, that of self-forgetfulness, and the outward semblance of it must be true and not assumed; self-abnegation implies consciousness, and of self-abnegation there was none in Dr. Chadwick. Credit to self was something to be put aside as of no importance in the face of a purpose at hand. Of this characteristic there are many instances, but the last of them has an especial bearing upon our thought to-day.

On a recent occasion of a farewell dinner, the chief guest, who knew him well, expressed the wish that a portrait of Dr. Chadwick might be procured by his professional friends, who best knew his great service in the conservation of medical literature,

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for presentation to the Boston Medical Library. The declaration to Dr. Chadwick of this purpose was met with a refusal so emphatic as to put a speedy end to the plan. "It is good to work," he said, "and if the work is good let other men take it up and carry it on, but there is no need of portrayal."

To us, with the memory of him so immediate, portrayal is not needed, but it is good to have the assurance, for those who come after, that his portrait will find its place here. So strong, so clear, so instinct with his life, is this our immediate memory, that it seems almost as if the door should open and that he should enter, that we, assembled in this building, the embodiment of his keen desire, should be as indeed in verity we are, his guests, and he the genial, hospitable, welcoming host.

DR. CHADWICK.

By James Gregory Mumford, M.D.

IT falls to few men that they are numbered with the immortals; and especially is this true of us physicians. Such memorialists as we have are honest friends in our own ranks, who now and again speak of us when dead, in words from the heart—words buried mostly for all they affect the larger world. Now and again a Holmes raises his voice in eulogy, or a Virchow or a Paget. Happy he for whom such men said the final word. But there are few words from the makers of great literature.

It is written, "by their deeds ye shall know them." By his deeds then we shall know Dr. Chadwick. Will you pardon me for paraphrasing the words of a great American? If they are out of tune, Dr. Chadwick would be the first to smile. It is not what we feebly may say here; it is what he did here, which shall live. This library is his creation, if we may believe spoken tradition and what has been written. More than any man among us he saw the meaning of what these walls stand for, and he devoted himself for more than thirty years to forwarding this work. His conception was broad, catholic and democratic. These great collections, these groaning stacks, these abundant files, these noble halls, these busts, pictures, memorials—illustrate in some faint way his conception of what a great literary foundation might become, if

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consecrated broadly to the uses of education and science. He believed the medical library to be the heart of our system. Lecture rooms, laboratories, hospitals serve their indispensable purposes. In them observations are made and deductions drawn, but the library is dedicated to the recording of knowledge. We collect here the treasures of the past, the works of our great prophets, without whose labors we should be as naught. Year after year we store in our files the records of science in process of evolution; and daily we add to our shelves the new books of most advanced thought.

Dr. Chadwick had something of the poet's as well as of the artist's temperament, and the silent potential of a noble library appealed to and stirred him deeply. He looked beyond the present. He believed that about this Library there would come to center the best scientific work and thought of a multitude; that toward this Mecca, as a common meeting ground, would be turned the steps of all physicians who labor to upbuild, to broaden and to dignify our profession; and that from here should emanate the concentrated wisdom, persuasion, and professional authority of our community.

I believe I have not misconstrued our friend's sentiments, or misinterpreted his ambitions.

His was a nature of buoyant optimism and frank reasonableness. In his death our Association suffers a grievous loss—not irreparable, as he would himself have said. His good works were many, and even though his accomplishments were not always commensurate with his pains, as is the fate of us all, this *Library* will remain a monument to a devoted, far-seeing and unselfish officer and friend.

EXTRACT FROM THE MINUTES OF THE MEETING OF THE COUNCIL OF THE BOSTON MEDICAL LIBRARY, HELD OCTOBER 10, 1905.

THE Council of the Boston Medical Library desires to put on record its keen sense of the great, we might almost say the irreparable, loss which the Library has sustained in the death of Dr. James Read Chadwick, its librarian. He may well be called the founder of the Library. In the thirty years which have passed since the modest beginnings of the Medical Library in Hamilton Place there have

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been four presidents, but only one librarian, and we doubt, however prosperous and prolonged its future, that there will ever be another quite his equal in all respects. He conceived it, he brought it into being, he nourished and nurtured and watched over it from day to day and from year to year, and he had his reward in that at last he saw fulfilled the desire of his eyes.

In one of his addresses, Dr. Chadwick says: "Every one likes to feel that he has a mission in life." He had more than one, but the first and last in his heart, and the one with which we are concerned, was the Boston Medical Library as the support here and elsewhere of sound medical learning.

Dr. Oliver Wendell Holmes spoke of him as the untiring, imperturbable, tenacious, irrepressible, all-subduing agitator, who gave no sleep to his eyes, no slumber to his eyelids, until he had gained his ends, who neither rested nor let others rest until the success of his project was assured.

Dr. Osler felt that to few is given the tenacity of will which enables a man to pursue a cherished purpose through more than a quarter of a century—*ohne Hast, aber ohne Rast* (his favorite quotation); to fewer still is the fruition granted. Too often the the reaper is not the sower. It was so with him.

Dr. J. S. Billings was led "by a sense of what is just and right" to say: "While the Boston Medical Library has been his special pet, for which no trouble was too great to take, and no sacrifice too great to make, all other medical libraries in this country are more or less indebted for their progress and prosperity to your librarian, Dr. James R. Chadwick."

All this was praise which he richly merited and which he would like to have in continued association with his name. We, his fellow workers, knowing it was true, take up the garlands which were so recently offered to the living and twine them, still fresh, around the memory of the dead.

Dr. Chadwick began his own address at the dedication of our present home by reminding us that on a sun-dial at Oxford University are these words: *Horae periunt it imputantur* (the hours perish and are to be accounted for). His hours have passed, and the accounting is to be found in his labors for this and other libraries; in his work for the American Gynecological Society; for the cause of cremation, in a busy professional life; in his many unrecorded acts of generous

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helpfulness and kindness; in the sixty or seventy titles of published papers, essays and addresses; and in many minor fields of less continuous activities. This is no mean record. His contemporaries knew him well, and their descendants will not forget him.

To the members of his family we offer our most sincere sympathy in the loss which they have met with.

O. F. WADSWORTH,
Secretary.

A MEMORIAL TO THE LATE DR. CHADWICK AT THE MEDICAL LIBRARY.

AT a special meeting of the Boston Medical Library held on March 30, it was voted to accept the report of the committee appointed at the annual meeting in November to consider the subject of a suitable memorial to the late Dr. James Read Chadwick, the founder, and for thirty years the librarian of the Library, and to authorize the committee to raise funds to carry out its recommendations.

It is well known that Dr. Chadwick's chief interest was the periodical library. He worked early and late to complete the files and carried his want book constantly with him. Therefore, the committee recommended that the periodical room be called the Chadwick Periodical Room and that a bust or portrait of him, with a suitable tablet, be placed in the room.

The committee recommended further that a book fund, to be known as the Chadwick Book Fund, be raised to provide for the purchase of periodicals, completion of files and the binding of periodicals, a department in which the Library has always been lacking in means; a suitable book plate to be placed in every bound volume.

It was also recommended that a memorial window be placed in Holmes Hall Reading Room, if the members of the Library shall approve of a design presented and now to be seen in the hall.

The committee now appeals to the many friends of Dr. Chadwick, in and out of the medical profession, for contributions to accomplish these objects. A considerable sum is needed. In the single matter of the book fund it is pointed out that the purchase alone of the periodicals last year cost over $1,500, the amount, by the way, of the Library's deficit for that

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year, and this takes no account of the binding. A book fund devoted to this purpose would be of the greatest assistance to the Library so dear to Dr. Chadwick's heart.

Contributions of any amount, large or small, may be sent to Dr. Clarence J. Blake, Treasurer, 226 Marlborough Street, Boston, or to any member of the committee consisting of Drs. Walter L. Burrage, Clarence J. Blake, Charles M. Green, James G. Mumford, Ernest B. Young.

TRANSACTIONS OF THE ASSOCIATION OF MEDICAL LIBRARIANS.

EIGHTH ANNUAL MEETING, HELD AT BOSTON, MASS., JUNE 10, 1905.

THE Eighth Annual Meeting of the Association of Medical Librarians was held at the Boston Medical Library, 8 The Fenway, Boston, Mass., on Saturday, June 10, 1905. The morning was spent in an inspection of the Boston Medical Library, and of the Treadwell Library at the Massachusetts General Hospital.

At 2.30 P. M. the meeting was called to order by the President, Dr. James R. Chadwick.

There were present Mr. James F. Ballard and Dr. Edwin H. Brigham, Boston, Mass.; Dr. William Browning, Brooklyn, N. Y.; Miss Ada Bunnell, Albany, N. Y.; Dr. James R. Chadwick, Boston, Mass.; Miss M. R. Charlton, Montreal, Can.; Mr. Arthur H. Chase, Concord, N. H.; Mrs. E. J. Collins, Boston, Mass.; Mr. Cutter, Northampton, Mass.; Dr. John W. Farlow, Boston, Mass.; Mr. Charles Perry Fisher, Philadelphia, Penn.; Miss Dema Gaylord, Northampton, Mass.; Dr. George D. Hersey, Providence, R. I.; Mr. A. T. Huntington, Brooklyn, N. Y.; Dr. Abraham Jacobi, New York City; Miss Metta M. Loomis, Chicago, Ill.; Mrs. Grace W. Myers, Boston, Mass.; Miss Marcia C. Noyes, and sister, Baltimore, Md.; Dr. and Mrs. Geo. N. J. Sommer, Trenton, N. J.; Dr. Walter R. Steiner, Hartford, Conn., and others.

The Minutes of the Seventh Annual Meeting were read by the Secretary, and, on motion, accepted.

Reports of officers were read as follows:

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REPORT OF THE SECRETARY.

Your Secretary begs to report that the transactions of the last annual meeting, the notes and news of the Association, etc., have been published in the MEDICAL LIBRARY AND HISTORICAL JOURNAL.

As directed by the Constitution and By-Laws, your Secretary has conducted the correspondence of the Association, retained copies of all letters written by him in behalf of the Association, and preserved on file all letters and communications received by him in his official capacity.

New members have been promptly notified of their acceptance by the Executive Committee, and all gifts have been acknowledged.

At the beginning of the fiscal year, blanks were sent to each member with the request that they furnish the historical data which it is desirable that the Association should have on file in its archives. It is to be regretted that but few of the members have complied with this request and furnished the information asked for.

Your Secretary also regrets the lack of interest in furnishing library news items and other contributions to the JOURNAL. Such items as have been published have been secured by carefully watching the news items in other journals, etc. A more active interest on the part of the various librarians in making the Association's official organ the forum for the free discussion of the perplexing questions that may arise in the administration of different medical libraries, and the publication of those items of news, etc., which are of mutual interest, is greatly to be desired.

Respectfully submitted,

ALBERT T. HUNTINGTON, *Secretary.*

On motion, the report of the Secretary was accepted and ordered on file.

REPORT OF THE TREASURER.

(FOR THE YEAR 1904-1905.)

INCOME.

Balance from previous year	$31.52
Annual dues from 40 libraries at $10	400.00

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Annual dues from 34 members at $5	$170.00
Arrears collected	60.00
Total income	$661.52

EXPENDITURES.

Expenses of the Exchange	$335.00
Subscription to the JOURNAL	139.00
Expenses of moving the Exchange from Baltimore	37.50
Freight and Cartage	113.07
Printing	21.50
Exchange on foreign drafts	.16
Expenses of Secretary, postage and stationery	12.46
Total Expenditures	$659.19
Cash balance on hand	2.33
	$661.52

Respectfully submitted,

June 10, 1905. GEORGE D. HERSEY, *Treasurer.*

Accounts and vouchers examined and balance found correct.

WILLIAM BROWNING,
WALTER R. STEINER,
Auditing Committee.

On motion, the report of the Treasurer was accepted and ordered on file.

REPORT OF EXECUTIVE COMMITTEE.

In making its annual report the Executive Committee herewith present the report made by the manager of the Exchange.

To the Executive Committee Association of Medical Librarians:

On July 1, 1904, the Exchange Bureau was transferred from Baltimore, Md., to Brooklyn, N. Y., where adequate space for the carrying on of its work was offered by the Medical Society of the County of Kings in its library building.

Commodious quarters are now provided in the basement of this building and the Medical Society of the County of Kings has provided shelving which will hold over ten thousand volumes for the use of the Exchange. This shelving may be largely extended as the necessities of the Exchange demand.

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It was early recognized that the future broad operations of the Exchange necessitated something more than a mere desultory distribution of stock on hand. Most of the work done during the present year has been along the lines of getting the vast quantity of material now on hand in proper shape to begin distributions. The plan of organization is such that it will permit of the rapid moving of the material now on the shelves and make room for the constant influx of new material. A systematic method for regular distribution has been devised and the wants of the various libraries, so far as they have been received, have been copied on cards so classified as to facilitate the most rapid and thorough selection of material for distribution.

While the year has been mainly one of organization, the Exchange has not been altogether inactive in sending out material. Shipments have been made, for the most part, during the last month. These distributions vary in size from three and four hundred volume lots, which have been sent to some of the smaller libraries, to the few volumes which the Exchange has sent to other libraries. During the year there have been sent out from the Exchange 2,497 bound volumes and 8,352 numbers of journals. The Exchange has on hand over 20,000 volumes and 100,000 numbers of journals, in addition to several thousand pamphlets, hospital reports, etc. It is hoped that a large proportion of this stock may be distributed during the ensuing year. In addition to filling the wants on lists sent in by the various libraries, it is proposed to send out to each member mimeograph lists of the titles of books, etc., which the Exchange has for distribution. These lists may be checked off and returned to the Exchange when the volumes selected will be sent to the recipient. This plan would have been put into operation the present year if the condition of the Association's treasury had permitted.

The largest donation to the Exchange has been by the Library of the Medical Society of the County of Kings, but no records have been kept of the exact amount of material given by this Society.

The Boston Medical Library Association has made a most generous contribution of 36 cases of books, journals and pamphlets.

The Library of the New York Academy of Medicine has

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given 3,589 bound volumes, 409 numbers of journals and 137 pamphlets.

The Library of the Luzerne County Medical Society has donated 450 bound volumes, 232 numbers of journals and 7 pamphlets.

Other donations include 2 cases of books containing bound copies of the remainder of the edition of Dr. Pliny Earle's "The Curability of Insanity," presented by the American Antiquarian Society of Worcester, Mass.

Thirty-six copies of the second edition of his "Manual of the Diseases of the Eye," by Dr. Charles H. May, of New York City.

Fifty-seven bound volumes by Dr. Harry Friedenwald, of Baltimore, Md., and fifty-six bound volumes of the "Transactions of the American Roentgen-Ray Society."

The following publications have been added to the list of those journals which send complimentary copies to the library members of the Association:

St. Louis Medical Review, Medico-Pharmaceutical Critic and Guide, Detroit Medical Journal. Correspondence with the *Journal of the American Medical Association* in regard to the continuance of free copies of this publication has been unsatisfactory. The Manager of the Exchange has been unable to ascertain what authority the business manager of the *Journal* had for removing the names of the Association's members from the *Journal's* free list. Unless adjusted at an earlier date this matter will be brought before the annual meeting of the American Medical Association for settlement.

Other free journals and transactions may be hoped to be added to the list of those already received, during the following year. The time at the disposal of the Manager of the Exchange has not permitted him to follow up this line of the Exchange's work as actively as he would have liked.

Respectfully submitted,

ALBERT T. HUNTINGTON,
Manager of the Exchange.

Your Executive Committee feel that the broad foundation plans which have been laid out for the development of the Exchange will result in a great increase in its activity and sphere of usefulness during the following and successive years. It has been provided with ample quarters which are secured without cost to the Association; even with the large amount of labor and time

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taken up by the preliminary work of organization the distributions of the Exchange have far exceeded those of any other year in the Association's history.

Efforts have been made to increase the membership of the Association and the following applicants have been unanimously accepted by your Committee and are recommended for election to library membership:

Library of the Hartford Medical Society, Hartford, Conn.

Library of the University of Maryland School of Medicine, Baltimore, Md.

Library of the Fall River Medical Society, Fall River, Mass.

New Hampshire State Library, Medical Department, Concord, N. H.

Library of the Medical Faculty, Queen's University, Kingston, Canada.

Worcester District Medical Library, Worcester, Mass.

Library of the Milwaukee Medical Society, Milwaukee, Wis.

Birmingham Medical Library Association, Birmingham, Ala.

Library of the Morgan County Medical Society, Jacksonville, Ill.

Cornell University Medical College Library, Ithaca Division, Ithaca, N. Y.

Library of the Bureau of Government Laboratories, Manila, P. I.

Library of the Royal College of Surgeons, London, Eng.

The following candidates have been approved and are recommened for election as individual members:

Dr. U. J. W. Peters, Birmingham, Ala.

Dr. Emmet Rixford, San Francisco, Cal.

Miss Ada Bunnell, Albany, N. Y.

Dr. H. Winnett Orr, Lincoln, Neb.

Dr. Aaron D. Davidow, Florida, N. Y.

Dr. Frederick G. Finley, Montreal, Canada.

Mrs. Elizabeth C. Gilbert, Brooklyn, N. Y.

Your Committee feel that the present small balance in the treasury of the Association will soon be increased and that the present plan of organization and dues will provide sufficient income for the ordinary expenses of the Association. It must be remembered that the removal of the Exchange entailed a considerable expense that the Association is not called upon to meet every year.

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The development of the Association's work will demand more money as time goes on, which will partly be met by the larger amount accruing from the dues of a steadily increasing membership. The work that the Association might properly undertake, however, calls for a much larger amount of money than there is any reasonable hope that the annual dues of members will provide. A little activity on the part of the Finance Committee would be a very desirable adjunct at this stage of the Association's growth.

Respectfully submitted,

JOHN S. BROWNNE,
CHARLES PERRY FISHER,
WILLIAM OSLER,
Executive Committee.

It was unanimously voted that all the above names of library and individual members approved by the Executive Committee be admitted to membership in the Association.

On motion, the report of the Executive Committee was accepted and ordered on file.

The following officers for the ensuing year were nominated and unanimously elected:

President, Dr. Abraham Jacobi, New York City.

Vice-President, Dr. George Dock, Ann Arbor, Mich.

Secretary, Mr. Albert T. Huntington, Brooklyn, N. Y.

Treasurer, Dr. George D. Hersey, Providence, R. I.

Executive Committee, Mr. John S. Brownne, New York City; Mr. Charles Perry Fisher, Philadelphia, Penn.; Dr. James R. Chadwick, Boston, Mass.

Finance Committee, Dr. William Osler, Oxford, Eng.; Dr. Frank J. Lutz, St. Louis, Mo.; Dr. Albert Vander Veer, Albany, N. Y.; Dr. Eugene F. Cordell, Baltimore, Md.; Dr. James M. Winfield, Brooklyn, N. Y.

At the close of the business meeting the scientific program followed.

PRESIDENT'S ADDRESS.

DR. JOHANN DAVID SCHOEPF, SURGEON OF THE ANSPACH-BAYREUTH TROOPS IN AMERICA, 1777-1784.

DR. JAMES READ CHADWICK, the President, read his address, with the above title, which was published in full in the July, 1905 (iii, pp. 157-165), number of the JOURNAL.

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DISCUSSION.

"SOME POINTS ON THE INTERIOR ARRANGEMENT AND CONSTRUCTION OF A BUILDING FOR A SPECIAL LIBRARY; THE SPECIAL LIBRARY BEING, IN A MAJORITY OF CASES, THE PROPERTY OF A SOCIETY, THE REQUIREMENTS OF THE SOCIETY MUST BE TAKEN INTO CONSIDERATION."

(a) Is it desirable to have the reading rooms on the first floor?

(b) Is one large reading room with gallery containing private rooms for dictation preferable to two or three smaller rooms?

(c) Is it better to have all the book stacks in one place (built to permit of horizontal as well as vertical expansion, according to space), or to divide them as illustrated in the new public library building now being constructed in New York City?

(d) Is it preferable to have the stacks built with a uniform width of shelving, say ten inches, so as to permit keeping all books of a class together (folios proper not considered, as they are kept apart in any case); or, *secondly*, to follow the old plan of having the lower shelves twelve inches and the upper shelves eight inches wide; or, *thirdly*, to have one or more sections, with shelving twelve inches wide, at the end of each row of stacks composed of eight-inch shelving.

MR. CHARLES PERRY FISHER, of Philadelphia, opened the discussion on this topic by reading a paper entitled, "Some Points in the Interior Arrangement and Construction of a Building for a Special Library," which is published in full on pages 107-112.

MISS METTA M. LOOMIS, of Chicago, thought that books too high to go in regular order on the shelves, when stood upright, might be made to fit their regular places by turning the books on their edges.

DR. JOHN W. FARLOW, of Boston, said that, on account of the noise, he did not regard it advisable to place the reading-room on the first floor of the library building.

DR. A. JACOBI, of New York City, in discussing the construction of the stacks, thought that all the space possible should be saved and did not favor having all the shelves of equal width.

MR. CUTTER, of Northampton, stated that the shelves in the Library of Congress are ten inches in width.

MR. ALBERT T. HUNTINGTON, of Brooklyn, in discussing the first question, agreed with the previous speakers that it was inadvisable to have the reading-rooms on the first floor on account of the objections that had been pointed out.

He regarded one large reading-room preferable to a num-

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ber of smaller rooms from an architectural standpoint, and also on account of the economy and efficiency of administration resulting from the fact that only one attendant was necessary to keep proper observation over all the readers.

As to the third question, he believed it most desirable to have all the stacks together rather than separated into two or or more wings. Where it was possible he preferred horizontal to vertical expansion on account of the easier and quicker service gained. These points of construction, however, inevitably must be governed by the amount of ground space, etc., at the disposal of the architect.

He did not favor having uniform wide shelves where economy of space was necessary as was almost invariably the case in large cities. His reasons had been set forth in the communication quoted by Mr. Fisher.

Miss Marcia C. Noyes, of Baltimore, inquired as to what percentage of the books in a medical library did not require more than the narrower shelf.

Mr. Huntington thought that not over thirty per cent. required shelves more than eight inches in width. Provided the shelves were flat and permitted books to project an inch or two over the back edge, where there was at least that much space between the backs of the two rows of shelving on opposite sides of the same tier, he had found that the ratio of two quarto shelves to five octavo shelves ran pretty evenly throughout the library. By using five narrower shelves at the top of each tier of stacks plenty of elbow room was given in the aisles, as the two wider shelves at the bottom did not extend much higher than the knees. Were wider shelves used throughout, more space would have to be used for the aisles and the capacity of the stack room would thereby be correspondingly lessened.

Dr. George D. Hersey, of Providence, Dr. Edwin H. Brigham, of Boston, and Mrs. Grace W. Myers, of Boston, contributed further discussion on this subject.

DISCUSSION.

"HOW IS THE LIBRARY TO BE BROUGHT TO THE ATTENTION OF PHYSICIANS WHO NEVER USE IT?"

Miss Metta M. Loomis, of Chicago, opened the discussion on this topic, quoting letters from many physicians in Chicago.

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MRS. GRACE W. MYERS, of Boston, spoke of the bulletin work done at the Treadwell Library. When any one particular subject was engaging the attention of the profession, typewritten lists were made of all the articles on this particular subject appearing in the current periodicals, and were posted in the library. These lists were changed from time to time, and after each bulletin had served its purpose it was filed away, kept up to date, and was always available to be used when literature was called for on the subject covered by the bulletin. The library had sixty or seventy of these bulletins on different subjects.

DISCUSSION.

"HOW MAY THE CIRCULATION OF MEDICAL BOOKS BE INCREASED, ESPECIALLY IN COUNTRY DISTRICTS?

MISS DEMA GAYLORD, of Northampton, opened the discussion on this topic, followed by Mr. Cutter, also of Northampton. Both speakers outlined the conditions in the smaller communities with not more than thirty or forty practitioners in active practice. It was thought that the circulation of books should be made as free as possible among such a limited number of doctors.

DR. CHADWICK, of Boston, spoke of his personal experience in Pittsfield where, under the stimulus of one man, the local profession took some interest in establishing a collection of medical books in connection with the Public Library. With the removal of that one man's energy, the interest of the local profession ceased.

DR. A. JACOBI, of New York City, regretted the indolence of the medical profession, especially in sparsely settled districts, as exhibited in their lack of desire to read and study medical literature and keep up with the progress of the times. He thought we must look to the young men to bring about a different state of affairs. In all the larger medical schools, the young men about to enter the profession, should be taught the absolute need of reading, buying and collecting medical literature after they had taken up active practice.

DR. GEORGE D. HERSEY, of Providence, spoke of the advantage of the telephone when physicians lived some distance from the medical library. Valuable time could be saved by ascertaining

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what resources the library could offer, and by having the books ready when the doctor called. The local medical journal, in many places, could be used to advantage in bringing the medical library to the attention of the profession.

MR. HUNTINGTON thought that the larger libraries ought to do more to help out the smaller ones. The example set by the Library of the Surgeon General's Office in sending its books all over the country should be more generally followed by the other large libraries, especially where such large library was nearer the applicant than the library at Washington. The Library which he represented had loaned books to physicians in small towns in Massachusetts when the logical and natural library to which such applications should have been made was the Boston Medical Library. He believed each library should extend its resources as widely and impartially as possible and not to take the narrow policy of restricting its benefits to the membership of the society which maintained the collection.

DR. CHADWICK stated that the Boston Medical Library had always granted any such applications that had been made to it.

DISCUSSION.

"WHAT ARE THE BEST BOOKS IN ALL BRANCHES OF MEDICAL LITERATURE PUBLISHED DURING THE PAST YEAR THAT A MEDICAL LIBRARY WITH A LIMITED APPROPRIATION SHOULD PURCHASE?"

MR. ARTHUR H. CHASE, of Concord, stated that his name was on the program to open the discussion on this topic, but that he did not feel prepared to do so. He had suggested the topic for the purpose of gaining, not of imparting information. In general literature there was published yearly a list of the best fifty books, and he thought it desirable that the smaller medical libraries should be provided with a similar guide to aid them in their purchase of a limited number of medical books.

DR. GEORGE N. J. SOMMER, of Trenton, thought such a list would be very helpful, especially to the smaller libraries with a limited appropriation.

The President appointed Miss M. R. Charlton, Mrs. Grace W. Myers, and Miss Marcia C. Noyes a Committee to prepare such a list and report at the next meeting of the Association.

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DISCUSSION.

"HOW ARE HOSPITAL REPORTS BEST CARED FOR?"

MRS. GRACE W. MYERS stated that at the Treadwell Library hospital reports are filed: *first,* according to country; *second,* according to State, or other division of country; *third,* according to city or town; *fourth,* according to the name of the hospital; *fifth,* in chronological order.

For protection, and convienence in handling, the reports are placed in manila covers, tied with tapes, and are suitably labelled on the backs. They are catalogued by name of hospital under the general heading of "Hospital Reports."

This closed the scientific program.

It was voted that the next annual meeting be held at a time and place to be fixed by the Executive Committee.

On motion, the meeting adjourned.

Following the meeting, the members of the Association were entertained at dinner at The Country Club, Brookline, as the guests of the local members.

TRANSACTIONS OF THE ST. LOUIS MEDICAL HISTORY CLUB.

MEETING OF ORGANIZATION, FEBRUARY 21, 1906.

A meeting of a few physicians interested in the study of the history, archæology, and philosophy of medicine was held on February 21st, at the Medical Library. Out of those invited to attend the informal discussion as to the ripeness of the time for the association of those interested in these subjects, with a view to their systematic pursuit, there were present Dr. Nathaniel Allison, Dr. L. C. Boisliniere, Dr. Joseph Grindon, Dr. W. A. Hardaway, Dr. F. J. Lutz,, and Dr. Kenneth W. Millican. Dr. Lutz was voted to the Chair. It was decided to avoid hard and fast lines of organizations as much as possible, and to that end the title of St. Louis Medical History Club was chosen, in preference to that of Society or Association. The only officer to be appointed is a secretary-treasurer, and Dr. Nathaniel Allison was elected to and accepted that office. The chairman will be chosen at each meeting. For the present it was decided to hold the meet-

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ings on the fourth Thursday of every month in the Medical Library building.

FIRST REGULAR MEETING, MARCH 29, 1906.

The first regular meeting of the Club was held at the Medical Library Building, 3525 Pine Street, on Thursday evening, March 29, 1906.

There were present Drs. N. Allison, James Moores Ball, L. C. Boisliniere, J. R. Clemens, J. Grindon, W. A. Hardaway, F. J. Lutz, K. W. Millican, R. E. Schleuter, H. N. Spencer, and A. J. Steele.

Dr. H. N. Spencer was voted to the Chair.

A paper entitled "Lycanthropy," by Dr. John Knott, of Dublin, Ireland, was read by Dr. K. W. Millican. The writer stated that the persistence of several of the most monstrous and groundless forms of superstition among sections of some of the more emotional communities is one of the most discouraging facts to those of us who would fain believe in the progressive intellectual evolution of the human race. One of the strangest of those startling epidemics of superstition (or mania) which history records is that of *lycanthropy,* or wolf-madness, traces of which, we are told, still occasionally appear in Southern Italy.

This belief in the transformation of the human body into the shape of a wolf was recognized in classic times and prevailed in Europe during the Middle Ages. The facility with which belief in lycanthropy was admitted in early Christian writings is well shown by the fact that St. Augustine refers to the famous (historic) case of the Arcadians of whom a certain number, chosen by lot, swam across a lake and were changed into wolves, and lived with others of the same species in the desert tracts of that country, in a state of primitive wildness. It is interesting to observe the serious and unquestioning faith with which he admits and discusses the popular view. If, he tells, during a sojourn of nine years in that form, they did at any time devour human flesh, they swam homeward across the lake by which they departed, and, on reaching their native territory, reassumed their original human form.

The writer of the paper brought to light many other excerpts from the older writers showing the extent of this form of superstitious belief.

He adds: "A curiously baseless fabric of historic hallucination

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is the belief which seems so largely to prevail in modern Protestant communities that the Reformation *enlightened* the mass of seceders from the authoritative influence of the Roman church on the nature of matters miraculous and supernatural. The violent discussions of the period undoubtedly shattered some 'pious frauds.' But the terrible physical, as well as moral and intellectual, unrest which pervaded Western Europe as a direct result of its influence during fully a century and a half brought many supernatural and mythical terrors into far greater prominence than they had previously occupied. The unparalleled vindictiveness of contending theological leaders and agitators kept permanently before the public eye the terrors of hell with its eternal flames, and its unsleeping sable monarch with his restlessly industrious smoke-stained garrison—who had, of course, securely enlisted all their opponents and persecutors. And the *Prince of Air* (with his countless host of demons) was brought into a position of prominence which he had never previously occupied. Accordingly, we find that *witches* became more numerous, *magic* art more widely distributed, and such crimes as *poisoning* more prevalent than they had been in the records of the older centuries. The astounding firmness of faith in witchcraft displayed by the most accomplished scholars of the sixteenth and seventeenth (and even, with more numerous exceptions, of the eighteenth) centuries, is one of the weird facts of history which may give us some reason to thank Providence that we were not born in those 'good old times.'"

At the conclusion of its reading, Dr. Knott's paper was commented upon by those present.

Dr. James Moores Ball showed a collection of antique portraits of various eminent medical worthies, giving a running commentary upon the subjects of the portraits.

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MEDICAL LIBRARY AND HISTORICAL JOURNAL

DEVOTED TO THE INTERESTS OF MEDICAL LIBRARIES, BIBLIOGRAPHY, HISTORY AND BIOGRAPHY

OFFICIAL ORGAN OF THE ASSOCIATION OF MEDICAL LIBRARIANS

EDITED BY

ALBERT TRACY HUNTINGTON

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Vol. 4 March, 1906 No. 1

EDITORIAL.

THE LATE DR. JAMES READ CHADWICK.

"We pass; the path that each man trod
Is dim, or will be dim, with weeds:
What fame is left for human deeds
In endless age? It rests with God."

MEN there have been, since the world began, whose death countless thousands have mourned. Men whose high degree of state has marked them as the nation's own have crossed the bar—and yet, of the sorrowing throngs, how many *knew,* as man to man? He was not of these.

Again, the candle's flickering flame grows dim, dies out, unnoticed save by the watching few, bound by the simpler ties of life, on whom the modest flame shed light—extinguished, plunged in gloom. He was more than these.

Inadequate our humble pen would be to those who knew him well. To the world who knew him not, the task were vain. The man is gone; his work will live. No such memorial could we

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erect as he himself hath wrought. The Boston Medical Library lives on and its benefits will be diffused to generations yet unborn. And if they know not to whom, for what, they owe—it matters little. He did not live his life in vain.

ANNOUNCEMENT.

The dates of publication of the JOURNAL have been changed and it will be published in March, June, September and December of each year instead of in January, April, July and October, as formerly. Subscribers will receive their full complement of four numbers each year, but each issue will be dated the last month instead of the first month of each quarter of the year.

While the publication of the current number has been delayed, it is expected that subsequent numbers will be issued during the month for which each is dated.

Owing to the length of the original articles in this issue it has been found necessary to eliminate or greatly curtail the JOURNAL'S other regular departments.

BOOK REVIEWS.

SUPERSTITION IN MEDICINE. By Prof. Dr. Hugo Magnus. Authorized translation from the German, Edited by Dr. Julius L. Salinger. *N. Y. & Lond., Funk & Wagnalls Co., 1905.* ix, 205 pp. 12mo. Price: Cloth, $1.00.

This little book is a translation of Prof. Magnus' "Der Aberglauben in der Medicin,"* with an additional chapter by Dr. Salinger on "Medical Superstition and Insanity." The authors have made no attempt to present a detailed history of medical superstition, but have endeavored, rather, to exhibit and to trace to their sources the more influential of those superstitious doctrines which from time to time have invaded, hampered, and cast reflection upon the practice of medicine. Those who have even an elementary knowledge of medical history will recognize much that is already familiar, but the mode of handling the subject, the straightforward and terse state-

* Abhandlungen zur Geschichte der Medicin. Heft VI, *Breslau,* 1903.

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ment of well-thought-out conclusions, and the earnest tenor throughout render the book of interest and value even to those well versed in ordinary matter-of-fact medical chronicle. It is entertaining, instructive and suggestive, and is well worth not merely perusal but actual study by all who are interested in either the development or future progress of medicine. By the former because it deals with certain errors and baneful practices of the past, and by the latter because careful study of the errors of our forebears cannot but yield counsel of present value and future influence.

Prof. Magnus declares at the outset that, though widely different in aspect and significance, "faith and superstition are twin brothers," both being descendants of a common stock. Both have originated, he says, from a sense of the inadequacy of human knowledge in relation to natural phenomena, the "consciousness of being dependent upon factors which are entirely beyond human understanding," and the endeavor to bring such factors within the reach of human ken. When all men believed in the actual existence of supernatural powers and looked upon *all* natural phenomena as manifestations of such powers, faith and superstition were one; but the reaction against the subsequently developed idea that natural phenomena could more adequately be explained by natural than by supernatural causes, created superstition as distinct from faith. Having made clear what is to be understood by "medical superstition," Prof. Magnus considers, in successive chapters, religion, philosophy, and natural science in their relations to it, and devotes his final chapter to the "Influence exerted upon the Development of Superstition by Medicine Itself." He points out that medical superstition has been diffused from the vantage ground and under the guise not merely of religion but of philosophy and natural science as well, but claims—and stoutly defends his claim—that superstition has never received encouragement, but has, on the contrary, always met with opposition at the hands of medicine.

Dr. Salinger evidently endorses this claim, for in his brief historical survey of superstition in relation to insanity (Chapter VII) he very plainly asserts that it was the meddling of the theologists with matters medical which gave rise to and sustained the long-time cruel treatment of the mentally deranged. But neither Prof. Magnus nor Dr. Salinger seeks to quarrel with religion, as such, or to set it over and against science, for both

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seem to recognize that the baneful religious practices of the Dark and Middle Ages are no more to be taken as a measure of modern religion than is the alchemic nonsense and deviltry of the same period to be taken as a measure of modern chemistry.

The preface by Dr. Magnus in the original does not appear in the translation, but, aside from this omission, the work of the translator has been faithfully and well done.

J. C. C.

NOTES AND NEWS.

The *Deutsche medicinische Wochenschrift* states that the Copenhagen and the Berlin academies of science have united in publishing a catalogue of all the Greek and Latin medical writings that have been handed down to us from antiquity. This catalogue is to be preliminary to the suggestion that the International Association of Academies of Sciences undertake the task of publishing a complete scientific edition of the collected works of the physicians of antiquity. The plan is to be proposed at the next general meeting of the delegates of the association, which will be held at Vienna during the spring of 1907.

The Exhibition of the History of Medicine in Art, which is to be held in Berlin on the occasion of the opening of the Empress Frederick Institution for Post-Graduate Medical Study, in Berlin, will comprise a large collection of medical incunabula. A feature of special interest will be a collection of manuscripts of the thirteenth century, among them documents belonging to the scholastic period, some of which have never been described. Painting in relation to medicine will be well represented, partly by reproductions and copies, but also by original works to the number of about fifty. In this part of the exhibition, Holland, whose art so often has found inspiration in medicine, will naturally be particularly prominent. Among the pictures will be original portraits of Albinus, Camper, and others, and the lately discovered large oil painting of Andreas Vesalius by Van Calcar.

The ninth annual meeting of the Association of Medical Librarians will be held in the Boston Medical Library, Boston, Mass., on June 4-5, 1906.

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A collection of rare old books and pamphlets, once the property of Prof. Ahlfeld, of Marburg, Germany, has been presented to the Johns Hopkins University Library, Baltimore, Md., by Mr. F. M. Jenks, a member of the Board of Trustees of the Hospital. They number 934, and are said to be very valuable.

The first annual report of the McGill Medical Journal Club, formed as an auxiliary to the Medical Library of McGill University, Montreal, Canada, shows a membership of fifty-five. The receipts were $112.77, and the expenditures $93.43. The income was devoted to subscribing for about twenty journals which were not already taken by the Medical Library.

The third annual report of the Medical Library Association of Brooklyn, maintained as an auxiliary body to the Library of the Medical Society of the County of Kings, Brooklyn, N. Y., shows an active membership of fifty-seven. During the three years since its founding, this Association has subscribed to a large number of important periodicals, paid for binding one hundred and sixty-eight volumes, and purchased a private collection of several thousand bound books, periodicals and pamphlets. All the above have been presented to the Library of the Medical Society of the County of Kings. The receipts have been $990.00, and the expenditures $705.86, leaving a balance in the treasury of $284.14.

W. B. Saunders Co. announce that they have incorporated under the laws of the State of Pennsylvania. The officers of the Company are: F. B. Saunders, President; W. D. Watson and R. W. Greene, Vice-Presidents; E. V. Hall, Secretary and Treasurer. The business of the Company will be conducted with the same policy and under the same management as in the past.

With the November, 1905, number, the *Central States Medical Magazine* and the *Medical and Surgical Monitor* consolidated with the title *Central States Medical Monitor.*

In becoming the official organ of the Minnesota State Medical Association, the *Northwestern Lancet* assumed the title *Journal of the Minnesota State Medical Association and the Northwestern Lancet* with the number of Nov. 15, 1905 (N. S., xxv, No. 22.).

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The *Journal of Medicine and Science* (Portland, Me.) suspended publication with its issue dated December, 1905 (xii, No. 1).

The *Alkaloidal Clinic* changed its title to the *American Journal of Clinical Medicine* with its January, 1906, number (xiii, No. 1).

The "Medical Progress Number" (Jan., 1906) of the *Interstate Medical Journal* is a notable achievement in medical journalism. The 216 pages of this single issue are devoted to a review of the medical literature of 1905.

NEW JOURNALS.

Archiv für physikalische Medizin und medizinische Technik: nebst Beiblatt: Fortschritte und Neuheiten der physikalisch-chemischen und photographischen Industrie in ihrer Anwendung auf das Gesamtgebiet der praktischen Medizin. Hrsg. von H. Kraft und B. Wiesner. Vol. I, No. 1, Jan., 1906. Leipzig, O. Nemnich. Mks. 12, yearly.

Journal (The) of Abnormal Psychology. Editor: Morton Prince, M.D. Vol. I, No. 1, April 1906. Published Bi-Monthly. Boston, The Old Corner Bookstore. Yearly, $3.00.

Morphologische Arbeiten aus dem anatomischen und zootomischen Institut der Königlichen Universität Münster i. W. Hrsg. von E. Ballowitz. Vol. I, No, 1, Dec., 1905. Leipzig, W. Englemann. No. 1, 4 mks.

New England (The) Alkaloidist. A Monthly Journal of Active Principle Therapeutics. J. M. French, M.D., and N. W. Sanborn, M.D., Editors. Vol. I, No. 1, Jan., 1906. Milford, Mass., Alkaloidist Pub. Co. Yearly, $1.00.

Philippine (The) Journal of Science. Edited by Paul C. Freer, M.D., Ph.D. Published by the Bureau of Science of the Government of the Philippine Islands. Vol. I, No. 1, Jan., 1906. Manila, Bureau of Printing. Yearly, $5.00.

Therapeutische Neuheiten mit besonderer Berücksichtigung der praktischen Medikation unter ständiger Mitwirkung von C. Stich. Hrsg. von P. Streffer. (Monthly.) Vol. I, No. 1, Jan., 1906. Leipzig, J. A. Barth. Yearly, 5 mks.

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MEDICAL LIBRARY AND HISTORICAL JOURNAL

Vol. 4 June, 1906 No. 2

THE DUTCH PHYSICIAN IN NEW AMSTERDAM AND HIS COLLEAGUES AT HOME.*

By Smith Ely Jelliffe, M.D.,

New York City.

WHEN we glance at a phase of life arbitrarily restricted by a period of time, we are peering at history with a lens in our hand that limits our vision to a certain narrow field. And yet we lose nothing by such circumstriction when we use a microscope; rather, as we swing around the high power and further limit our field, do we gain in distinction and minuteness of detail what we could never get in a broader scope.

The Dutch physician in New York is a subject that appears to the naked eye of the mind as one of slight and narrow interest, but on applying the lens of historical research we have had fascinating glimpses of a rich and active period of medicine.

The Dutch would doubtless have been content to fetch and carry the merchandise of other nations in a peaceful, business-like way, had it not been for the rampageous and proselyting spirit of Spain who fought to make them wear the Catholic yoke. The plucky spirit of resistance made the Dutch traders combine conquest with trade, and at the beginning of the seventeenth century the Dutch formed a West Indian Company to trade, and capture whatever might be profitable on the coasts of Africa and South America. With their large commission to roam and fight for twenty-four years, the company incidentally established some trading posts on the Hudson and the Delaware. The Hudson they had called the North River and the Delaware the South River, and all the land that lay between was the New Netherlands. It did not worry the New Netherland Company that portions of this land had been given to the Virginia Company by James of England: their only particular interest lay in the

*Read at a meeting of the Charaka Club of New York, Feb., 1906.

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furs which were to be obtained, and for the purpose of trading they erected a few huts on the end of Manhattan Island that looked toward the sea, doubtless in the neighborhood of the Battery.

The New Netherland Company grew into the great West India Company, and incidentally in its business of conquest and treasure-seeking it found time to make some systematic plans of colonization. In 1625 there were two hundred Dutch colonists in the lands claimed, some at Fort Orange, some at Fort Nassau, some on Manhattan Island, others on Long Island and in Connecticut.

In 1627, after two years under a good governor, they were three hundred strong, and had built warehouses and batteries of stone at Fort Amsterdam, and had sent home sixty-one thousand guilders' worth of forest timber and furs. Moreover, the wampum which the Indians accepted as money was to be found among other shells on the Long Island shores, so that the Dutch had the advantage over their neighbors at Plymouth.

In the forty years that followed, the fair wooded island of Manhattan and the environs were let out in large grants to a few rich purchasers, but the settlers did not come in ship loads with their families as to the English colonies in Plymouth and Connecticut, so the Dutch, seeing how hard they would be pressed, offered free passage to the colony, and allowed all to trade on equal terms.

The men sent to govern the Dutch colonies were but hirelings or reprobates, and until the sturdy wooden-legged Peter Stuyvesant came there was little spirit in the Dutch colony of a thousand occupants of New Amsterdam for anything but personal trade.

Therefore, when Charles II., seeing how unpleasant it would be to have a stolid Dutch colony lodged at the mouth of the Hudson between the New England Colony and the Virginians, presented New Netherlands to his brother James, the Duke of York and Albany, and dispatched a man of war to take possession in the Duke's name, there appeared to be nothing else for the surprised and doughty Peter Stuyvesant to do but to march out of the city and let the English march in.

This happened in 1664, after a period of forty-three years of formal ownership by the Dutch, but it by no means signified a Dutch evacuation, for at the beginning of the eighteenth

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century about 5,000 Dutchmen lived side by side with an equal number of Englishmen in the town of New York.

This period of forty-three years, extended virtually through the seventeeth century to perhaps seventy-five years, is therefore the boundary line in time of our subject, the Dutch physician in New York.

A village of wooden houses, surrounded with peaceful orchards and farms, a post-house at Chatham Square where one might rest before plunging into the wild forests of Harlem where Indians lay, this was the setting to which the occasional ship's doctor brought a little medicine from the old world. Hardly enough we might at the first survey feel to warrant a discussion, until we turn on the high power of perspective and look at the quality of medical thought that must from the first have been brought to the Dutch beginnings.

In the town of New Amsterdam there were appointed in the earliest days Zieckentrovsters, or comforters of the sick, who doubtless administered simple remedies with nursing and medicines, and as the colonists' families increased the midwife became a necessity.

There are three of these worthy women mentioned in the annals of New Amsterdam. Lysbert Dircksen was the town midwife in 1638, and at the direction of Governor Van Twiller a house was built for her at the public expense. The next was Yryntje Janss, who served the colony for two years, dying in 1646. Her daughter, Annetje Janss, so we hear, had some difficulty in collecting the monies that were due her mother from the West India Company. Whether these were large or small, certain it is that Annetje Janss was able to buy the property which in later days her descendants sold to Trinity Church. In 1660 we find that Hellogond Joris had been granted, five years before, the sum of one hundred guilders a year for her services to the poor.

The Dutch physician who cast in his lot with these early traders, as well as those that practiced after the occupation of the English, bore to the new world the same relation that an American ship's doctor or army surgeon bears to the Philippines. He was an imported product, and must have been attracted either by motives or gain or restlessness to fare so far forth to practice medicine. To get any idea of his personality and his equipment we must turn our lens upon Holland, and there

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among the myriad enterprises of this fermenting, creative nation, then in its zenith, we see the science of medicine vividly set forth in both the literature and art of the day.

After the famous siege of Leyden the citizens were offered as a reward of bravery either ten years' exemption from taxes or the erection of a university. They showed the stuff they were made of and chose the latter, and in 1575, about fifty years before the Dutch came to New York, William of Orange founded this university which was really the birthplace of modern medicine.

UNFINISHED SKETCH, BY HANS BUYTENWECH, SHOWING ANATOMICAL LECTURE-ROOM AT LEYDEN UNIVERSITY IN 1600. ORIGINAL IN THE BOIJMAN'S MUSEUM.

Niebuhr, the historian, has expressed his opinion that no locality in Europe is so memorable in the history of science as the ancient Senate Hall of the University.

These progressive Dutchmen selected their professors carefully and paid them liberal salaries, with the result that students came from Russia, Germany, Scotland and all of civilized Europe. So it may fairly be inferred that some of the men who fared from Leyden even to the wilds of New Amsterdam were well-trained cosmopolitan gentlemen.

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An unfinished sketch by Hans Buytenwech, of which I have been able to obtain a photograph of the original in the Boijman's Museum in Rotterdam, gives us an idea of a Dutch anatomical lecture room of the seventeenth century, in just such a one and in just such garb as our early Dutch physician in New York must have studied. The students wear knee breeches, cloaks hanging from the shoulder, and carry a sword at their side. Their tall hats, decorated with ostrich feathers, cover their heads as they crowd over each other's shoulders to watch the dissec-

"THE ANATOMIE OF DR. EGBERTS."
Painted in 1619 by Thomas de Keyser.

tion by the uncovered professor. Even the student's dog is in the picture, having descended the stairs of the theatre to look for his master in the crowd. The dog has always been a feature of the students of Leyden. To-day five and six dogs in one bedroom is not an uncommon thing, and as the dogs accompany their masters to their clubs, special numbered kennels are in readiness, and the student checks his dog along with his umbrella and overcoat when he enters.

The sixteenth century had been distinguished by a remarkable development of anatomical teaching, due chiefly to the work of

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Vesalius. The States of Holland, recognizing the value of dissection, resolved, in 1593, that the bodies of their criminals should be placed at the disposal of the professor of anatomy at Leyden, and in 1597 a suitable anatomical theatre was provided, and in consequence the anatomical school at Leyden soon became the most distinguished in the world.

The interest which the Dutch as a nation took in their medical schools in the early seventeenth century led to the creation of some of the masterpieces of portraiture by Rubens, Franz Hals

"THE ANATOMIE OF DR. W. VAN DER VEER."
Painted in 1617 by Michael Janszon van Mierevelt.

and Rembrandt. The proud position in which the teaching of anatomy placed the university caused the pictorial demonstration of this subject by many artists. Among these is "The Anatomie of Dr. Egberts," painted in 1619 by Thomas de Keyser. In this picture the famous doctor is surrounded by his fellow collegians, Dirk Koolvelt, Jakabs, Gerrit Indies and Jan de Wees. Dr. Ebgerts alone wears his high hat.

Another is "The Anatomie of Dr. W. van der Veer," by Mierevelt, painted in 1617 for the hospital of Delft. In this picture we gain some idea of the satisfaction and pride with which the

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Dutch physician bore himself. He feels the honor which his genius confers upon the hospital where his picture is to become immortal. The face of the criminal's corpse has been charitably screened from the curious eye of posterity, his abdomen has been opened to show all he contained, and the demonstration of Dr. van der Veer's skill is perfect, and yet his fifteen beruffled colleagues have no further interest in the laparotomy than to hold their bowls and instrument gracefully and look their best. Contrast this piece of work with the famous anatomy lesson of Dr.

"THE LESSON IN ANATOMY."

Painted in 1632 by Rembrandt Harmensz van Rijn.

Tulp, by Rembrandt, who had himself been a student in the University of Leyden, and we see the eager, energetic spirit of the listeners and we can get some idea of the Dutch master's ease and dignity and familiarity with his subject, and his power of entertaining and attracting and sustaining the interest of his students.

Nicolaas Tulp earned well his fame as practitioner and surgeon, for he added a knowledge of pathology to his anatomy. The subjects of the dissecting table which had hitherto almost

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without exception come there from the gallows, did not, except by accident, throw much light on anything but anatomy, pure and simple, but Tulp investigated and described, with excellent

"DIE AERZTLICHE BESUCH."
("The Family Physician.")
Painted by Jan Steen.

drawings, stone in the kidney, irregularities of the uterus and tumors of the ovary.

The Dutch family doctor of the fifteenth and sixteenth cen-

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turies had attained an ideal of comfort and well-being which would be hard to leave to go pioneering. Picture the plain wooden houses that sprang up around the trading posts at Forts

"DIE LIEBESKRANKE."
("Lovesickness.")
Painted by Jan Steen.

Manhattan, Orange and Breucklyge and then contrast the life of the University medical student who came to America to practice medicine with that of his brother whom he left behind. The Dutch family physician, as painted by Jan Steen in the painting

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which hangs in the Mauritzhuis Hague, was an honored guest. He is here portrayed as well dressed, sitting at leisure in the richly furnished bedroom of his patient. She reclines gracefully in her draped four-poster box-bed, with the curtains drawn, while her mother, as was the custom, served refreshments to the doctor.

From the other painters of the time we gather that there existed as great a contrast between the real scientific practice of medicine and the art of medicine as practiced by a quack as there is at the present day.

"PHYSICIAN OPERATING ON A PEASANT'S FOOT."
Painted by Audrien Brouer.

In one of his most jovial moods Jan Steen paints a quack removing "Pebbles from the Head of a Refractory Boy." An old lady at her wits' end to know what to do with her troublesome boy brings him to the doctor who, seeing his chance for a fee, assures her that her boy has pebbles on the brain, which he proceeds to remove. The mother holds the basin to catch the blood, an appreciative hand-maiden behind the quack's back supplies him with pebbles as fast as he needs them, which, while the

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doctor scratches vigorously behind the boy's ear, he lets fall with great effect one by one into the basin, while a crowd of grinning neighbors watch the proceeding from the window.

Probably the early Dutch settlers of America were too busy to indulge in quackery, and the life was too hard to encourage the lovesickness that Jan Steen was so fond of painting, so instead of the pictures of languishing maidens in rich interiors, we would find our colonial types and homes reproduced in such pictures as Audrien Brouer's "Physician Operating on a Peasant's Foot," and David Tenier's picture of "The Village Doctor."

"DER LANDARZT."
("The Village Doctor.")
Painted by David Teniers.

For the names and deeds of the early physicians in New Amsterdam I am greatly indebted to the sketch of "The Doctor in Old New York," published in the Half Moon Series, by Dr. Francke Huntington Bosworth. He records the physicians, English, French and Dutch, whose names are mentioned in the early annals of our city, until the end of the eighteenth century. The arbitrary limitation of our subject confines our attention to

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the Dutch physician who practiced in New Amsterdam until about the end of the seventeenth century.

Dr. Johannes La Montagne, the first educated medical man who arrived in New Amsterdam, was probably just such a man as we have seen in the Jan Steen pictures. He was a learned Huguenot gentlemen, who had received his degree from the University of Leyden. He married Rochel de Forrest, of Leyden, and after practicing in that city for a number of years he was inspired by the example of his wife's family, who had emigrated to America, and in 1637, at the age of forty-two, he came to New Amsterdam with five children and his wife. She died within a few years of their arrival in the crude village, but he married again and entered actively into the life of the colony. His reputation naturally gave him prominence in the village, and he was called upon to officiate in many other capacities beside that of physician. Governor Kieft appointed him, the year following his arrival, to a seat in his Council, a position which he retained under Governor Stuyvesant. When the question of a public school for the colony was raised it was La Montagne that was appointed schoolmaster. He did Governor Kieft the kindness, on one occasion, to save him from assassination, and, the warlike spirit being forced upon him, he was sent with an expedition of fifty men to defend Fort New Hope, which is now New London, against an attack by the Massachusetts colonists.

When the English arrived to surprise the Dutch by taking away their possessions to present to the Duke of York, they found Dr. La Montagne in command of Fort Orange. As Vice-Director he was obliged to surrender to the newcomers, but he remained Dutch in his affiliations, and it is believed that he accompanied Governor Stuyvesant on his return to Holland in 1665, and that he himself died there five years later.

His daughter Rachel married Dr. Gyshert Van Litroch.

A year after the arrival of Dr. Montagne, namely, in 1638, there came two surgeons to New Amsterdam, Gerrit Schult and Hans Kierstede. They arrived in company with the new governor of the colony, William Kieft, and probably held some official position. Whether Schult returned soon or not we cannot say. His name is not found again in the records. But of Kierstede we hear much. He is described as a "surgeon" and is referred to in the annals as "Surgeon Hans." He appears to have had an extensive practice. He received several grants of land in the

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neighborhood of what is now Pearl Street. He married Sarah Rollofs, the daughter of Annetje Janss, by whom he had two children. It is recorded of him that he served the company "long and faithfully." He died in 1666. The spirit of medicine still was with this family, and may have existed previously for I know not how many hundred years. It certainly continued for over two hundred after the advent of Hans. His second son, Rollof Kierstede, was a surgeon, and a younger son, Jacobus, born in 1663, was the first surgeon and physician in Flatbush, L. I. Surgeon Hans Kierstede prepared for the colonists a famous unguent, which has enjoyed a sale until the present day. Thirty years ago his great great grandson, Gen. Henry Y. Kierstede, who kept a drug-store at the junction of Seventh Avenue and Broadway, was still selling it under the family name.

In the same year as the successful and enterprising Kierstede, in 1638, came another physician whom fortune did not favor. This was Dr. Peter Van der Linde, who sailed with his wife, Elsje, in the ship *Sira*. She soon died. but Van der Linde married Marthe, the wife of Jan Menje. In those days the necessity of making a livelihood kept men from specializing in anything so unremunerative as medicine, and as one of the schoolmasters of the day eked out his income by taking in washing, it is no surprise to learn that Van der Linde held the post of Inspector of Tobacco, and took his turn at being schoolmaster. He did not stand well with Peter Stuyvesant, nor get along well in the colony, so he finally left it.

Governor Kieft, who succeeded the weak and sluggish Van Twiller in 1638, proved himself to be a foolish and short-sighted man when it came to any question of large policy. He treated the Indians in a faithless and exasperating manner, and by demanding tribute from friendly tribes and letting them be massacred by the Iroquois when they fled to Fort Amsterdam for protection, he finally succeeded in antagonizing all the Indians, so that they united for a war of extermination. Every farm and settlement was in danger. White men were murdered everywhere, and the peaceful Dutch settlers were in such danger that it was necessary to call in a company of soldiers from Curacoa to put an end to the Indian war.

Accompanying them came Surgeon Paulus Van der Beeck. The grants of land were lavish in these days, and a certain Widow Bennett owned a farm of nine hundred and thirty acres

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in Gowanus, a thickly populated section of Brooklyn to-day. The Indians had devastated her farm and burned the house which stood not far from the present entrance to Greenwood Cemetery. The gallant Surgeon Van der Beeck married the widow at the close of the Indian war, and rebuilt the house and reclaimed her land. He devoted what time remained over from farming to the practice of medicine, and thus was the first physician practicing in Brooklyn. The records show that he was at one time tithe collector, and again ferry master. His ferry plied across the river from Brooklyn to New York, but was not to be counted on for rapid transit, as there is a record of his being severely reprimanded by the Council for keeping passengers who wished to cross waiting "half the day and night before he would carry them across the river." This energetic and enterprising soldier-surgeon was rated as one of the wealthy men of the colony before his death, for in 1675, thirty-two years after his arrival in New Amsterdam, he was assessed "two polls, two houses, four cows, three ditto of three years, one ditto of one year, and twenty morgens of land of the value of £133, 10s."

In 1647 the names of William Hayes and Peter Brucht appear in the annals, and between 1649 and 1652 John Can, Jacob Mollenaer, Isaac Jansen and Jacob Hendrichsen Varvanger are recorded as having practiced among the colonists. Some of these men were undoubtedly ship's surgeons who were called upon for their services while ashore: for no one of them seems to have settled permanently except Varvanger. Indeed, in the sixth decade of the century only three names of physicians appear steadily. There were Kierstede of the ointment fame, L'Orange, of whom we know little, and Dr. Jacob Hendrichsen Varvanger. He came from Holland in 1646, and served the Company until the English took possession, and then took the oath of allegiance and continued his practice. He imported his own medicine at his own expense from Holland, and there is on record a note of his asking the Company to refund him payment for the same. He seems to have prospered, for in 1674 the valuation on his property was 8,000 florins. Varvanger was the West India Company's surgeon during the latter years of Governor Stuyvesant's rule. He seems to have been a very progressive and philanthropic man, and concerned himself with the condition of the sick soldiers and employees of the Company. He reports to the Director and Council the discomforts of the sick due to

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the cold and untidiness of the houses in which they are cared for, and he begs that a proper place may be arranged for the reception of such patients, and that a faithful person shall be appointed who should take care of it and assist the sick with food and fire, the soldiers paying for this extra care out of their wages and rations, while the Company's negroes would be attended at the Company's expense or as thought advisable.

The result of this suggestion on the part of Varvanger was the establishment of the first hospital in North America. It was opened in 1658 and Hilletje Wilbruch, the wife of Condil Tubias Wilbruch, was appointed its matron at a yearly salary of 100 florins. It was afterward known as the Old Hospital, and was sold 102 years later when its buildings had become too old for use.

Varvanger and Kierstede held the first coroner's inquest in the colony in February, 1658. The subject, Bruyn Barentsen, had received a severe beating from Jacob Eldersten during a quarrel. The doctors acquitted Eldersten, as they found that after the beating the victim, Bruyn, had been able to row across the river to Breuckelen.

The social register of 1657 divided the city's personages into two groups, the "Great Citizens," numbering twenty, and the "Small Citizens," numbering 204. Varvanger's name is found among the latter, indicating undoubtedly that the social standing of the surgeon of the company was not as high as that of some of the other officials.

Fort Orange was the home of two physicians of repute among the colonists. Dr. Abram Staats settled there in 1642. He was a man of judgment and good business capacity, and soon became a member of the Council, and drew up one of the treaties with the Indians. His experience with them was bitter, for his wife and two sons perished in their own house, which was burned by the savages. Like others in these small posts, there were not enough people to warrant specializing of labor, so with the others he became a fur trader and owned his sloop which sailed between Albany and New Amsterdam. He had one son, Samuel Staats, who was born in New Amsterdam, educated in Holland, and became a well-known physician in New York during the latter part of the seventeenth and early part of the eighteenth century. Still another son, who escaped the massacre, became a physician in Albany.

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The second Dutch physician at Fort Orange was D'Hinnse, who taught medicine to students from the surrounding settlements. The old records at Albany mention him in connection with a lawsuit in which he sues a certain Thomas Powell for his fee. The doctor's contract with this patient was by the year. He was to attend when needed and to receive in payment ten beavers per annum, valued at $6.40. But the physician claimed this was for medical attendance only, and in consideration of surgical services rendered he demanded a further fee. This case proved too advanced for the environment and was never decided.

I have not been able to find any record of the regulation fee for services to patients whom the company surgeon did not serve, but such fees were doubtless very small, and may have often been paid in kind as in the case of the two beavers. A hundred years later an act was passed making the highest fee for every visit or prescription in town or within five miles, five shillings, and for every mile above five, sixpence. But the decree also stated that anyone who had taken a degree in physic in the University should be allowed to charge double that amount.

This shows that even a century later a diploma in medicine was not necessary to practice; indeed, in the early days of the colony when people not in the employ of the West India Company began to arrive, there were a number who practiced any sort of medicine or quackery. These were recorded as having some pill or drink to sell, and the question was brought up whether a certain French Huguenot, Le Feber by name, should be permitted to sell a medicinal water prepared by him. The permission was given, but with some doubt, as brewers and wholesale dealers, including distilleries, were not allowed to keep tavern or sell beer or wine at retail.

But the chief ethical question that required settling by the Dutch colonists was the privileges and limitations to be accorded to the ships' barbers who wished to act as surgeons when ashore.

This custom of combining the arts of the barber and the surgeon dated back to the Middle Ages, when the practice of medicine was almost wholly confined to the clergy. Certain abuses led the ecclesiastical authorities to forbid the clergy from practicing outside their monasteries, and later they were forbidden to shed blood.

In the days of the shaven-headed monks every monastery

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had its barber, and to keep within the letter of the law the barber was sent forth to let blood, and perform minor surgical operations, and thus by degrees the barber surgeon came into existence and arose to be a great corporation. Thus the surgeons in New Amsterdam wished the privilege of shaving, and the ships' barbers wanted to practice on shore. This led to the usual rivalry which appears to have existed everywhere between the less competent barber surgeons and the legitimate surgeons. The matter was finally settled by an ordinance which stated that the colonial surgeons might shave anyone as a friendly act but not for gain, while the ships' doctors, while on shore, were not to dress wounds, nor administer medicine, unless especially permitted by the company's official doctor. This enactment, which appears in the Dutch Records of New Amsterdam in 1652, is probably the first ordinance passed to regulate the practice of medicine in New York.

The first question of ethics raised was probably due to an effort made in 1657 to oblige the doctors to do detective work. An ordinance was passed notifying all surgeons that when they are called on to dress a wound they shall ask the patient who wounded him and pass the information on to the Burgomaster. Whether or not this side of their duties caused the University men from Holland to revolt in their desire to maintain an honorable professional secrecy is not recorded; but it certainly shows that there were brawls and commotions a-plenty.

Since these early days there have been many honorable and distinguished Dutch physicians in New York. But, though they may have more adequately interpreted the spirit of the great Dutch Universities which gave such an impetus to the medical world, yet there remains with me a lurking respect for these hardy pioneers, who fought the Indians and traded, and helped the colonists with their teachings and councils, who nevertheless, at the same time, perhaps, cherished as high and imperative professional ideals as those of a later day, who found fewer obstacles in realizing them.

"To record the names and preserve the memory of those whose great achievements have conferred benefit and lustre on their fellow-men has in all ages been regarded as a duty, and felt as a gratification to wise and reflecting men."—*Meryon.*

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THE TREND OF MEDICAL PRACTICE.

By Franklin C. Clark, M.D.,
Providence, R. I.

FOR the last quarter of a century there has been growing by slow and imperceptible degrees a radical change in the methods of medical practice which bids fair to disturb the equilibrium hitherto existing between the physician, the prescription-druggist and the public at large. All three are interested parties; but the last is the most important of the three in that it constitutes the one whose needs have called the other two into existence and whose patronage the others equally seek. This change of attitude has been brought about by a combination of causes, to consider which is the purpose of the present article. The subject will be considered under three aspects, namely, in its medical, pharmaceutical and popular relations. All three are mutually dependent, and for this reason should work together harmoniously. The preservation of this equilibrium is, therefore, of vital importance to all three.

Thirty years ago it was the generally accepted dictum, except in the rural districts and the smaller villages, for the physician to write his prescriptions which were filled by the local apothecaries, as they were then called. Nor did the public raise any complaint of this practice. In cases of emergency, however, it was not considered beneath his dignity for the practitioner to furnish whatever medicines were required at the time; neither was it objected to by the faculty that the pharmacist should render "first aid" to the sick or injured in case a physician was not at hand to give the necessary assistance. This was the unwritten law, solemnly observed both by physician and pharmacist. No respectable member of either class thought for a moment of encroaching on the province of the other. The relations were most friendly in every way. Each one saw clearly the dependence of the one upon the other and endeavored to maintain those relations as far as possible.

So was it understood by the public. The physician or surgeon was not a dispensing doctor, or apothecary, as the term is still understood in England. On the other hand, the druggist, as he was usually styled down to a very recent period, did not openly, if at all, join the practice of medicine with the sale of

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drugs and the filling of prescriptions. This double function of the apothecary had no recognition with us except in name, though in the country districts, (and generally during the colonial period,) the medical practitioner was, down to very recent times, a vender of drugs and medicines also; in which capacity the grocer was to some extent his rival. Until the reform in pharmaceutical matters was effected, the grocer and the old-time druggist were never distinguished very clearly. The true function of the English apothecary, however, survived in theory, at least, if not in practice; and an old-experienced and respected druggist was often given through courtesy the title of physician, as if belonging to the medical profession in reality. The early custom adopted by physicians in this country of supplying their own medicaments, without doubt, contributed to the practice. But, as the population of the country increased, a separation was made between the functions, more rapidly in the thickly-settled districts. The druggist, meantime, added to his stock in trade an assortment of articles, consisting of numerous little conveniences or luxuries, such as cigars, toilet articles and general notions which, in time, began to be associated with a part of the legitimate business. The sale of patented medicines also greatly contributed to the profits of the druggist. There thus seemed to be a gradual separation between the old-time practitioner and the early apothecary; and if a physician opened a surgery or drug shop, it was usually in connection with his profession to supply his patients with whatever medicines were needed in his practice. If he sold to the public generally, it was because his was the only place where drugs could be obtained, or else to eke out a small income.

Such were the relations existing between physicians and pharmacists or druggists (the two terms must be understood to refer to the same occupation) down to a period not far from thirty years ago; and, again, between these two and the great public. Of course there were exceptions to this practice; but the exceptions were chiefly apparent in the rural districts and among some old-fashioned practitioners in the cities and the larger towns; but this class of practitioner did not fail to make charge for such medicines in their bills. There was no physician, however, who sold drugs separately from giving advice unless he became exclusively a druggist; in which case he did not usually continue the practice of medicine. On the re-

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form in pharmacy above adduced, the two professions of medicine and pharmacy were regarded as two distinct occupations. Although the latter was placed on a much higher plane than ever before, the druggist was no less a druggist, with his qualifications and duties prescribed by law. The standard had been greatly raised, but his province remained the same. The two (physicians and pharmacists) were thus clearly distinguished; the first was a prescriber, the latter *only a dispenser* of medicines.

It may be interesting at this point to compare the situation of affairs in this connection in England. In that country there has stood between the ordinary physician and the dispensing druggist, or chemist (now termed pharmacist, as with us), and dating from the latter part of the sixteenth century, an intermediate form of medical practitioner, known as the apothecary,* not in the sense in which he was familiar to us in this country. Down to the year 1790 he constituted both a druggist and physician, at which time the chemists and druggists proper came into existence and formed a distinct class of tradesmen. This was another class in the community, but whose province was confined by law to the sale of drugs and medicines and the filling of prescriptions. But this, again, did not alter the status of the older apothecary who combined the practice of medicine with the sale of drugs, thus overlapping the two provinces of druggist and of the trained physician. The business of chemist and druggist was restricted to the sale of drugs, medicines and the filling of physicians' prescriptions. The chemist from a very early date did a strictly legitimate business. Thus, in the medical role in England, so to speak, there are three factors to be considered, the physician proper, the apothecary and the pharmacist; the consulting surgeon is on a par with the regular physician.

The apothecary, or surgeon-apothecary (called by both names), was from the outset what is understood to be a general practitioner. He has what is known as a "surgery," where he prepares and vends medicaments and fills physicians' prescriptions. He attends the sick and furnishes his own medicines. His status is not altered by the privileges allowed the chemists and druggists; and he is addressed as plain "Mister,"

* See the "Postscript" appended to this article.

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with the general surgeon. But he is, nevertheless, in one sense of the word, a "counter-prescriber," though with this difference, namely, he is a legally qualified practitioner and attends the sick at their homes when occasion requires. He was and is the country physician, and in cities usually attends the poorer classes. His medical qualifications have been increased from time to time down to the present day, so that the poor have a well-qualified practitioner to attend them in sickness, with the additional advantage of not being obliged to pay a chemist for medicines.

Hence there is considerable difference in the fees charged by the guinea physician and by the low-priced apothecary; and the price of the medicaments prescribed by the regular practitioner is not included in his fees. By Act of Parliament the apothecary is not permitted to charge for both advice and medicine; in fact his fee includes both. His fee varies from a half-crown (62½ cents) to a full crown ($1.25), according to the character of the attention, that is, office-consultation or house-visit.

The medical education of the apothecary was at first conducted under the apprentice system in the same manner as physicians were generally educated with us down to the last half of the nineteenth century; though in the case of the apothecary his education was chiefly pharmacal. Each apprentice was indented to some respectable, master-apothecary for a period of five years. For a long time all his knowledge of medicine was obtained in this way, including the rudiments of medical botany, drugs and pharmacy proper. As time went on some attendance on lectures in a legally recognized medical school was also required before the candidate was granted a license to practice. Though termed a "sub-physician," a sort of intermediary between the physician, or regular graduate of medicine, the English apothecary of the present is not the poorly qualified practitioner he was from thirty to sixty years ago. On the reform inaugurated in medical education in 1878, the requirements of all classes of medical practitioners in the Kingdom were raised by law and the standard of qualification for practice made one and the same for apothecaries as well as for the other practitioners. Hence the English apothecary, so far as his medical education is concerned, does not differ from members of the Royal College of Physicians, or of Surgeons; in fact, before he takes out a license to

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practice at all, the apothecary deems it an essential procedure to obtain first a license from the Royal College of Surgeons. Thus, apart from the ever-increasing class of modern specialists, three classes of practitioners are to be distinguished, namely, the Physician proper, the Surgeon, and the Apothecary, or general practitioner.

Thus, for a period of more than two hundred years, the poorer classes of England have had, for a comparatively small fee, the services of a well-qualified person to meet the requirements of ordinary sickness. For consultation or for additional advice the poor have had recourse to the higher-priced surgeon or physician.

As we review the history of medical practice in this country a similar method of education may be noted in the case of our early physicians. The apprentice, or apothecary system, of medical instruction can hardly be said to have fallen into desuetude before the last quarter of the preceding century. Before the establishment of medical institutions in this country, this apprentice system was the sole means of medical instruction except for those who may have had the means for study in the medical schools abroad, instances of which have not been of rare occurrence. Most of our early physicians and surgeons, therefore, were but English apothecaries in fact, if not in name. But here the parallel ends. All went by the title of "Doctor," if only a mere dabbler in physic. Our medical system, accordingly, was from the start, for various reasons, not necessary to be stated here, somewhat different from that obtaining in the mother country. One reason, the most obvious, was, perhaps, the newness of the country and the new conditions arising. New conditions demanded changes in the body medical as well as in the body politic. And, for one thing, all ranks were leveled, in and out of the medical profession. There was no distinction made whatever between one class of practitioner and another; the pretentious quack was put on a level with the most gifted English practitioner. Hence the American has never been acquainted with this distinction among medical practitioners; even the distinction between physician and surgeon was never very generally made until within a very few years, that is as two separate classes of practitioners. Neither were the people of this country accustomed to employ physicians whose prices depended on a medical class-system, so to speak. The poor demanded as high-priced a physician as did the millionaire, even if beyond their means of payment, if they paid at all. The

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proud-spirited American citizen would no more think of employing the services of a medical attendant, who occupied a secondary position as a practitioner as indicated by dropping the distinguishing title, than of cutting off his right hand. Hence such a difference as existed, in England, between the ordinary physician and the apothecary, would have been, and probably is, impossible in free and enlightened America where titles are not so unattractive as the institutions of the country would imply. The free and independent Yankee wants no half-way doctor; it is with him the "real article" or nothing. When he seeks a druggist for relief he tacitly, at least, diagnosticates his own case and thereby does not lower his pride. But if he employs a medical adviser, it is always a person with the generally acknowledged title, even if self-constituted.

If the public, then, were loth to accept the services of any but an accredited or full-titled physician, the physician, on his part, was no less disinclined to drop a title so alluring. He must, at least, be as worthy of the title as the veriest charlatan, a numerous class in every community. By degrees the regular physicians, in the cities and larger towns where qualified druggists were established, gave up the sale and dispensing of medicines to their patients and confined themselves to the giving of advice and the writing of prescriptions which the aforesaid druggist or pharmacist compounded for the patients. This was exactly the practice of the English physician down to the present day, from the date of his license before the reign of Elizabeth. He never opened a shop or dispensed drugs in any way except in his contention with the early apothecary on his first appearance in England. The country physician, however, was always practically an English apothecary with the title of "Doctor." But, in the case of the former, the medicines supplied his patients were always rendered in his bill, many of which accounts are still in existence. If the physician opened a shop as a druggist, and not as a physician, he rarely acted as a physician. He was never, so far as may be ascertained, a "counter-prescriber." He carried on a strictly legitimate drug-business and did not interfere with the practice of those physicians whose prescriptions he may have had occasion to fill. These medico-druggists were of rare occurrence, since most physicians were unwilling to resign their practice for this purpose. Those physicians who engaged in that business were rarely, if ever, guilty of conflicting with the practice of other

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physicians: they were never guilty of the same offense as are our modern retail pharmacists in too many instances.

Passing through this apothecary stage, the American practitioner in medicine finally developed into a non-dispensing physician in the cities and larger towns for reasons given above. In such places the public began to have dealings with two parties now, the physician and the druggist—two persons to be considered in the settlement of bills for medicines and medical attendance. The physician might now, and did so in very many cases, discount his bills in cases of extreme indigence; but there was still the druggist to settle with who might reduce prices for similar reasons if so disposed. But there were two persons to deal with, and the two bills seemed together much larger than the single charge formerly rendered for like services. The poor and those penuriously inclined sought the aid of patent medicines and some accommodating druggist for their smaller complaints; while the physician was only called upon for diseases of a graver character.

The regular physician was now becoming rather too expensive to be generally employed by the growing class of the poor in the community. To meet the problem certain reforms were initiated from generous or interested motives (perhaps a little of both), emanating from each of the three interested parties.

First, let us consider the medical profession. Private generosity is all well enough in its way, but the medical profession is a business as much as any other, and, if it does not pay, it must, like every ill-paying business, give place to a more lucrative one. The education of a physician is too expensive to be taken up thoughtlessly with the idea that it is an enormously paying business, with little or no losses to meet, as judged by an ignorant laity. The fool of the family can no longer become the successful physician, if ever he did, other than in works of the imagination of the last century. There is such a thing, then, as a physician being too generous for his own welfare, especially if he has a family. Private benevolence has been much underrated by the public, and the physician is often blamed for insisting on the legitimate profits of his business, profession, attendance or whatever else his services may be denominated. To meet the problem the physician has done all that he could unless he has had a private income large enough

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and a fondness to practice medicine great enough to pursue his occupation on Howardian rather than on business principles. Dilettante practitioners however, are not in much request.

Our hospitals and dispensaries and other medical charities helped matters to some extent in providing cheap medical attendance, but, barring cases of abuse, they only reached a certain class of indigent persons, *i.e.*, those in extreme poverty—the true objects of all such charities. But a class, and a constantly growing one in the community, was still unreached, who did not like the idea of being classed among paupers and defectives, and yet were unable to pay the seemingly high price of the ordinary physician. In England this class of persons would naturally have recourse to the apothecary, and would not feel humiliated by so doing. In the vast majority of small ailments, bad symptoms or incipient diseases no other advice would be required. It is among this large and growing class that the physician (in the larger towns at least) is losing his hold. Here the "counter-prescriber" has met the public half way and through his means the patronage of the regular physician has greatly fallen off in these latter days. Add to this the patented and proprietary medicines and mere charlatanism, and the old-time quack will be seen to have taken on himself a new and more attractive protean shape.

To stem their ebbing practice, the physicians resorted to various expedients, one of which was to supply medicine to their patients gratis, in the manner of a free chromo or trading stamp. Such a custom was the more feasible from the fact that all kinds of medicaments had become much cheaper than ever before, and were manufactured in endless number and variety, in a less bulky compass and in most elegant and palatable forms. In adopting this practice the physician was following no new custom. It was the general practice among all physicians one or two generations back, and had been followed by the homeopaths for over a generation. There was a small class of practitioners, however, who did not fall into this habit. The scientifically trained physician could not confine himself consistently to a class of ready-made medicines which, however large it might be, could never be large enough to draw upon in the scientific treatment of all disorders. Nor did the average physician have capital enough to open a shop and keep on hand this constantly increasing number of new remedies. For these reasons, this practice was slow in developing among the great bulk of practitioners.

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A second method was to reduce the ordinary fees for attendance. This was adopted in some of the larger cities, but did not prove as successful as was anticipated. For no physician ever is reluctant to reduce his charges for cash-patients in most cases, especially among the poorer classes; and so there was no need of giving out such general notices, while the practice served but to lower the reputation of every practitioner thus acting. Hence this method gradually fell into disrepute.

At this point a new factor entered the problem; this was no other than the manufacturing chemist, and not the local druggist with whom the dealings of the physician had hitherto been wholly conducted. These wholesale druggists or jobbers endeavored to engross the whole market of the country at the expense of the local dealers. In this way most of the preparation and compounding of drugs, such as pills, triturates and liquids was taken almost entirely out of the hands of the local dealers and dispensers of medical supplies. The manufacturing chemists were thus bidders for the retail trade.

The next step was to enlist the interest of the physician in the exclusive employment of these ready-made prescriptions at the expense of those formerly prepared by the local druggist. By means of advertisements and generous samples their agents stormed the offices of physicians and by their enterprise and statements enlisted vast numbers to use these preparations; and the manufacturing chemist took pains to see that their medicines should be well endorsed and made appropriate for every malady treated by the practitioner. By this means the local pharmacists, on the introduction of this new class of remedies, found their regular prescription-trade falling off rapidly, since sooner or later they were obliged to fill the prescriptions of physicians with ready-made medicines. Add to this the fact that these proprietary medicines, as they now began to be called, were sold in large quantities to the public direct and not on physicians' prescriptions. In this way these manufacturing chemists or jobbers succeeded in killing two birds with one stone, and the public had at hand a means of self-treatment, as we shall see further on, of which they were not slow to avail themselves.

Thus it happened that there were now two middle men between the public and the physician, namely, the jobber (himself a sort of dispensing druggist) and the pharmacist. The emoluments of the local druggist were now greatly lessened, and, where

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physicians furnished their own medicaments or prescribed proprietary and ready-made medicines, the local druggist was forced to act as a go-between or agent of these manufacturing firms, receiving but a small profit over the first cost of the medicines; and where he did not dispense these new remedies on prescriptions, his profits from the direct sales to the public were much less. Then, if he supplied the physicians with these remedies for their own use, after deducting the usual discount allowed physicians, his percentage on such sales was still further reduced.

As the manufacturing chemists increased in number, the pharmacists in the smaller cities gradually recovered their equilibrium and in self-defense began to compete with the jobbers in the market, in order to save for themselves the small profit which they had hitherto lost. They also followed in the steps of their predecessors, using the same methods of pushing their products into the medical market as had been done by the larger houses. This plan protected a large number of local pharmacists and enabled them to establish a healthy competition. But as the competition ran higher, remedies were fabricated in unlimited quantities and varieties; liquids, powders, tablets, triturates, compressed remedies, etc., were put on the market at astonishingly cheap rates. In short, the era of cheapness had reached the medical world, or rather the dosing world. The market was flooded in every direction; agents were sent out by enterprising firms to the most remote districts, outbidding each other not only for the trade of every local druggist, but endeavoring to induce the medical practitioner himself to substitute the remedies of their respective firms for prescriptions of his own compounding or prescribing. Many of the physicians fell into the trap and thus virtually permitted these jobbers to prescribe for their patients, and opened a way for the patients to prescribe for themselves.

Under the name of proprietary medicines, ready-made medicines flourished like a green bay tree. Portable, elegant in form many times, exceedingly cheap and palatable (too palatable, perhaps, considering the character of many of their alleged ingredients), they offered a temptation to the hard-worked physician, too irresistible to be long withstood. They actually forced out of use the officinal medicaments taught in the ordinary medical schools and prescribed by the national pharmacopœia, in too many instances. Of course the physicians using them could not pretend to much scientific knowledge in the treatment of disease. Medi-

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cinal cases were now manufactured of the most elaborate and elegant workmanship, outshining the saddle-bags of our grandfathers. Patients now looked for a gratuitous supply of medicines as they did for trading stamps and for other inducements to complete any commercial transaction. But still they were ready-made medicaments and had no advantage, as experience has shown, over the old patented medicines except in the fact that their ingredients were in most cases given on their labels. They failed to satisfy special instances of disease, as every ready-made drug must do. The older physicians, and chiefly those of high scientific attainments, have not been favorable to the new practice, but the great body of the profession, to "catch trade," as they say, have carried the practice to a lamentable extent.

Those of us who can look back thirty years or more and will compare the two modes of practice, the old and the new, may very readily trace the several steps which have led up to the new mode. The commercial spirit of the age seems to have entered the profession of medicine by a back-door, so to speak, where not so much the interests of the patient are concerned as the fear of losing patronage, "trade," and so the physician more and more entrenches on the province of the legitimate druggist. The same condition of affairs existed in Germany on the appearance there of homeopathy. The chemists lost considerable trade from the custom of the homeopaths of furnishing their own medicines as was not done by the regular profession; and where this class of practitioners prevailed to any marked degree, the loss to the local druggists was considerable. Hence much opposition was made to homeopathy by the Germans on that score, but on purely commercial grounds. But when a similar practice began to show itself among the regular physicians of this country, the druggists and pharmacists met the question in an entirely businesslike manner, not in loud-voiced opposition. It should be noted here that the local druggists were the alleged injured persons; for the manufacturing firms had given them the cause for complaint, by supplying physicians with many ready-made drugs which the smaller firms could not supply.

Instead of appealing to medical ethics to right their grievances, which by this time had fallen, unfortunately, to a pretty low ebb, the aggrieved pharmacists throughout the country made their appeal to the most interested party of all, the public, and through their pockets at once secured their suffrages. The whole ques-

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tion now resolved itself into a matter of supply and demand—and of endurance. There had been a constantly increasing demand for cheaper commodities in every direction; and the medical market, so to speak, did not escape the effects. The era of cheapness had dawned. The cry now was for cheap drugs and cheap doctors. For some time the medical profession stood proof against the change. Hospitals and dispensaries were not enough; they were only intended for the extremely indigent class. It was hoped now by people even in good circumstances to obtain skilful medical attendance at reduced rates. This was attempted in several ways. One was by the physicians reducing their regular fees, already referred to. Again, beneficiary societies were formed which engaged physicians to attend their members by the year at so much a head, each person paying a small annual assessment which would entitle him in case of sickness for any medical treatment he might require during that year; sometimes the family was included in the agreement. In case of corporations which employed large numbers of men, the salary might be considerable, though the labor was out of proportion many times to the emoluments. In case the physician did not furnish his medicines (in which event the fees were greatly reduced) arrangements were made with some druggist to give a discount on the medicines and prescriptions required by the society-physician. The local druggist was thus sure of his pay and was given, besides, most of the trade of the members of such associations. Some practitioners, especially the younger members of the profession, took this way, as a sort of stepping-stone, to establish a practice by attending the families of the members as well. Others looked rather askance upon the practice; but as the competition among the physicians augmented, this practice has continued.

This plan of meeting the difficulty was, however, confined to the larger manufacturing establishments, to the operatives, to special trades and to a few benevolent institutions. But the great mass of the people did not share in any of the advantages claimed for these combinations. To those (and some others) who pleaded that their limited means would not allow them to pay both for a physician and for the medicines ordered on his prescriptions, three courses were open. They might have recourse to the old-time patent medicines and other nostrums; to the new ready-made proprietary remedies, now rapidly coming into use; or to

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some enterprising accommodating pharmacist, a cheap method of obtaining medical relief after the fashion of a bargain-counter. But this last practice did not come into full swing until fifteen years or so later. The physicians first set the example of using these proprietary medicines in their practice and distributing them gratuitously among their patients, acting in this respect, virtually, as a dispensing druggist or apothecary. It was thought that they might in this way hold more patients.

Another great modifying factor, as has been noted above, was the manufacturing chemist, as he called himself, and more than anyone else he has hastened the change. By the production of new and elegant preparations, both officinal and proprietary, in endless number and variety, and of astonishing cheapness, and then by securing the cooperation of the physicians to use them to the exclusion of other remedies, both by pushing them into the market by their enterprising agents and through attractive advertisements and circulars, the manufacturers not only drove out of the market most of the officinal drugs but greatly lessened the number of legitimate prescriptions written, forced the local pharmacists to the wall, and for the first time in the history of medicine gave the laity an opportunity of treating themselves for numerous small ailments which was once done by the physician. For the labels of these proprietary medicines not only show their composition but state all the disorders (by symptoms) to which such remedies are applicable. Each package is usually accompanied by booklets, pamphlets, and other "literature," containing cases, recommendations and endorsements of physicians as well as of the laity. Now since these medicines had the endorsements of reputable practitioners, by being employed mainly in their prescriptions, the local druggists possessed a ready means of treating the numerous ills which formerly were treated in the physician's office. Thus the public could find relief for any trifling ailment at a comparatively small expense; they could, at least save the office charge of the physician. At the same time the pharmacist was enabled to make a greater profit than he ever had by using the same drugs in prescriptions; and, if he added a reasonable fee for advice (?), to be included in the price of the medicine, his profit was proportionately larger. The labels on each original package enlightened him as to its contents and uses in the same manner as they did the physician, and by the employment of careful judgment the same results could apparently be

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obtained, at least no harm would be done. The druggist was not slow in availing himself of the opportunity.

In his competition with the manufacturing chemists and in the lessening cooperation of the medical profession, the local pharmacist, in order to keep his head above water, adopted two methods, honorable or dishonorable according to the point of view from which they are regarded. One method is known as "substitution;" the other "counter-prescribing." The first method may undoubtedly be set down at once as dishonorable from every point of view.

The physicians, at this stage of the controversy, usually purchased their medical supplies directly from the manufacturer or through their agents, or "medical drummers," and deserted the local trade to a large extent. Though the local druggist allowed the physician a discount on such supplies, it was expected that the business sent him by the physician would compensate him for such professional courtesy. While his profits in this direction had largely fallen off, he still was expected to grant the same favors as before, and a physician purchased everything he could obtain at a reduced price, medical or otherwise. Toilet articles and cigars were included in these supplies.

Meantime the qualifications of the pharmacist had been extended and more stringent laws passed for the maintenance of a higher standard of excellence. By the requirements of the new law the pharmacist was made acquainted with as much chemistry and physics and the general principles of the Materia Medica as had been demanded of the physician a generation ago. To this knowledge he added the study of pharmacy, now acquired by outside lectures or from special schools.

The pharmacist being now more intimately acquainted with therapeutics in his courses of study, was more capable of correcting errors in the prescriptions of careless physicians. This, surely, was an assumption of knowledge which the old-time druggist never ventured to attempt. Besides knowing as well as the practitioners themselves, the ingredients of the proprietary medicines, which physicians were now generally prescribing and the disorders they claimed to cure, the pharmacist had at hand a means of doing a little prescribing on his account; and, if he used discretion, he would not be likely to be found out. Such a temptation became too irresistible; and the first method of proceeding, to stem the tide of competition, was what is known as

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"substitution." However such a practice may be viewed, this is no place to discuss its morals. For it must be regarded as one of the steps in that process of evolution in the practice of medicine which is now taking place and follows those methods which will most contribute to its consummation.

Substitution was accomplished in two ways. Either the pharmacist did not have one or more of the ingredients called for in the prescription to be filled, and so he used the remedy which answered the conditions as far as possible of the original drug; or he wished to substitute a drug of his own preparation, thereby realizing a greater profit in the transaction. These substitutions were mostly made when certain proprietary remedies were specified in the prescription—a growing tendency. And as the writers of these were always careful to specify the make, the pharmacist had no means of using his own preparations, even if of exactly the same composition, unless in this irregular way. The physician did not seem to regard the local druggist as capable of preparing his own medicines. He seemed to be more impressed by the statements of drummers than by the well-known reputation of a druggist in his own community.

These substitutions were the more easily accomplished when prescriptions were composed wholly or in part of proprietary products. As many of these new remedies were advertised to cure the same diseases and, to give them weight, they were prescribed by well-known practitioners, substitution was never so easy. The semi-medical education of the pharmacist allowed him to choose those remedies that best fulfilled the condition of those for which the prescription called and which from a medical or therapeutic standpoint would stand but a very slight chance of being detected, unless the medicines required were of such a nature that substitution could not be attempted by other than a tyro. But so far as the public was concerned, the pharmacist would gain rather than lose reputation by the operation (owing to the uncertainty of medicines in general), besides adding to it that of being a careful and competent person. But, of course, this great public is kept in total ignorance of the facts. This is clearly a case of prescribing in the guise of a pharmacist. He interferes with the strict orders of the physician and virtually, in too many cases, assumes a superior knowledge. Substitution may be regarded as a most contemptible method of throwing discredit, openly or otherwise, upon the physician.

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But the greatest source of profit to the pharmacist of all irregular methods, is "counter-prescribing." The profits are small in individual cases, but large in the aggregate. In this practice he has the sympathies and cooperation of the public who are ever ready to circumvent the physician in any way they can. It is just here where he gains his greatest reputation as an accommodating druggist; he sympathizes with poor, suffering humanity, appreciates their desire to save a few cents on their doctor's bills. But, at the same time, he is feathering his nest at the expense of not only the doctors but of that very public. It is computed that millions of dollars are made annually on the sale of the so-called penny-candies. Though each moiety of candy must be handled several times over before it comes into the hands of the last purchaser, the profit is at least one hundred per cent. The same may be said of "counter-prescribing." The individual sales are likewise small, but in the aggregate will be very large and hence, exceedingly remunerative. And, if this sort of business is not overdone, but is carried on judiciously, the pharmacist may continue to follow the practice until the law circumscribes the relations between the physician and the pharmacist more clearly and prosecutes all evasions of such statute.

The history of counter-prescribing is interesting. The custom of applying to the druggist or apothecary (at first the two names were synonymous), both in England and, as a natural consequence, in this country, dates from a very early period. It is coeval with the history of medicine and flourished in an irregular manner till the first decade of the sixteenth century. It was confined to the druggists and grocers until the rise and license of the English apothecary, as will be considered elsewhere. This practitioner, as we have already adduced, furnished his own medicines and treated the sick both in his surgery (shop) and attended such also at their homes. Such was the custom of all our early physicians with hardly an exception. Even when in the larger towns the physicians ceased to supply their own medicines, the druggist, or apothecary as he was then denominated, was more or less sought for the relief of trifling complaints or in cases of emergency. The apothecary usually kept a small stock of ready-made remedies on hand for special diseases, together with an assortment of nostrums and patent-medicines with which we all are familiar. The latter were nothing more than the prescriptions, for the most part, of some prominent physician. These

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ready-made medicaments established the precedent of treating the small ills which form a part of the physician's office-practice. So long as the relations between the pharmacist and the physician continued close and interdependent there was no friction, and the little informal prescribing was generally overlooked.

With the advent of proprietary medicines, however, in their elaborate dress and vast variety of forms and wonderful claims of cure, a change came over the spirit of pharmacy. We have seen how the medical profession became infatuated with these new products, to the exclusion of their own prescriptions. Unlike patented medicines and other secret nostrums, the formulas of their composition were given on their labels, together with the list of disorders for which they were applicable. The label or fanciful name they assumed was what was called "trade-marked," which was, in effect, the same thing as being patented. This was the only obstacle to their use in general, but so slight that it finally became no bar to their adoption. Thus a pharmacist could easily treat cases of diseases, if only by reading these labels; and, as time went on, there was hardly a local pharmacist in the cities and larger towns who did not manufacture a "proprietary" of his own: and the war of proprietary remedies began, destined to become of gigantic proportions. As a result, counter-prescribing became the order of the day, a sturdy bantling. But critical cases could not, of course, be thus handled.

It must now be clear to every reader that the pharmacist is attempting to play two roles, commercial and professional. Did he renounce his regular occupation for the latter he must of necessity conflict with the medical faculty directly, unless he qualified for a physician and took out a license according to law, to that effect. But this would require an expensive course of study in addition to his present one which, in the large majority of instances, he could not afford to do. However, there are numerous examples where pharmacists have become physicians after pursuing the usual course of study for which they had resigned their former business. Taking things as they are, counter-prescribing seems a more profitable pursuit.

This change of front in the druggist of this country is interesting from a historical point of view. It is, however, a devolutionary rather than an evolutionary process; for it appears that the drift of public opinion here is going backward to a condition of things which prevails in Great Britain and which it was

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thought had been left for good and for all at the time of our separation from that country. I refer to the English apothecary, already discussed. He is distinctively the physician to the poor and to those in moderate circumstances; and, as he carries his own medicaments, the expense is somewhat lessened; and then, his fees are proportionately small. His loss would be an irreparable injury to the community. Though there is no such practitioner with us, there is a growing tendency among certain classes of physicians, backed by the counter-prescribing of the pharmacists themselves, to meet this want. The latter practice is of course illegal and should be suppressed. But few prosecutions under the law have been as yet made; or the practice has not, perhaps, been offensive enough to call for drastic measures for its suppression. The physicians themselves are treading altogether too much on his province not to give the pharmacist a grievance of his own. If the law defined the relations between the two more clearly, a remedy or a satisfactory compromise might be secured.

In England medical matters are managed much better. The apothecary's functions are definitely prescribed; the druggist, chemist or pharmacist is only permitted to pursue a legitimate drug-business; he is legalized only to sell drugs and medicines and fill the prescriptions of medical practitioners. He vends no "notions," toilet articles, and all sorts of flummery now found in the American drug-shop. He is debarred by law from giving advice for even the most trifling complaints. Nor will he prepare medicines for anyone unless they are individually designated. He must not infringe the privileges of either the surgeon, physician or of the apothecary, some of whose duties, as we have stated, overlap those of the pure pharmacist.

In America the pharmacist seems gradually to be encroaching upon the functions of the physician, though he thus far does not visit the sick at their homes as does the English apothecary. The moderate-poor are thus supplied with cheap advice, or medicines with advice thrown in, seemingly to advantage, so far as fees are concerned. But how different from the way such things are managed in England! There the poor have a well-qualified physician to attend them and to supply the needed medicines, who is recognized by law. But ready-made advice, like ready-made drugs, is cheap, and peculiarly attractive to the public. The bargain-counter has reached the medical profession.

From whatever standpoint this condition of affairs may be

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considered, it is certain that there is a growing demand in the community for a less expensive medical attendance, especially among the working classes, similar to that which has been in operation in the mother country for some centuries. The growth of cities, increase of population and expense of living demand some such provision. To be sure, hospitals and dispensaries supply this demand in some measure; but we do not want to raise up a race of paupers which shall look to institutions for relief and not to their own efforts. It is not in harmony with modern society to create two classes in the community, one to support the other without the latter's making any attempt on their side at self-support.

What the pharmacists are now doing surreptitiously, under the cover of their registration papers, supplies for good or bad that demand. Did they but go a step further, qualify themselves to do such business, they would thus meet the physicians half-way and have no cause to blame the medical practitioners for encroaching upon their old-time privileges. The good feeling between the two would not be strained to the degree it now is. The mercenary spirit has permeated the two professions too strongly to be immediately eradicated. In this way there might be established a regular class of chemists or pharmacists, as in England, who would cease selling soda-water, fancy drinks (if nothing worse) and a host of other articles which bear no relation whatever to the business of a pharmacist. For a graduate in pharmacy to make it his business to vend such articles to the great exclusion of his legitimate sales, is, to say the least, rather humiliating.

The physicians, especially in the larger towns where there were pharmacists established, would cease to carry their own medicines. In other places the new practitioner would serve in the place of his English colleague. He need not give up his old, familiar title so dear to his heart; he need not call himself a sub-doctor. By whatever name designated, he would not be sailing under false colors as does the counter-prescriber, who occupies a nondescript position. The younger physician might not unnaturally follow the new practice, at least for the first few years of his professional life, as it would give him a practical knowledge of drugs, by actual handling, which the average practitioner rarely has. He would then be able to fill his own prescriptions and possess a better knowledge of pharmacy.

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It is, of course, impossible to adduce when this change will be complete; it depends altogether upon the clearness with which the physician and the pharmacist perceive their proper provinces and what is for their ultimate and best interests. However, some sort of compromise, as the case now stands, seems to be necessary on account of the great competition in all departments of business and the weakening of what is known as professional etiquette or ethics. The annexation of drug-counters to the large department stores makes the problem of still greater difficulty of solution.

The increasing scepticism among all classes in regard to the efficacy of drugs in the treatment of diseases of most kinds, especially of those of a preventive character, strengthens rather than weakens the position taken by the counter-prescriber. The increasing custom among the physicians of dispensing their own medicines (both for self-protection and for mercenary ends) has not corrected the evil. Specialists have thus far been secure from all such encroachments; perhaps for the reason they are usually made the last resort of the afflicted and are sought when every other means of relief has failed. Either the physician should become a pharmacist or the latter a physician. A compromise would be an English apothecary. And here the case rests.

POSTSCRIPT.

The history of the English apothecary may be given in brief. He is entirely of English production, in no other part of the British dominions did he find recognition.

The first apothecaries occupied rather a dubious position. They at first joined the sale of herbs, simples and other drugs with spices and groceries generally, and were known under the name of druggists and grocers, the earlier names being "pepperers" and "spicers." By degrees they began to prescribe for the common ailments and would even visit the sick at their homes and prescribe for them there as did the ordinary physicians. In this way they came in conflict with the regular medical profession (the physicians and surgeons) which had been licensed a century previous. These practitioners had obtained their diplomas from reputable medical institutions, which was not the case with the apothecaries, hence the opposition. In the first part of the seventeenth century these grocers and druggists were licensed to practice medicine, much to the indignation of

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the regular physicians and surgeons. It must be remembered that the regular profession did not supply their medicines, but wrote prescriptions as they do to this day.

To oppose the apothecaries, as they now were called, the physicians and surgeons joined forces against these encroachers on their special privileges, as they regarded them, and claimed that the apothecaries did not possess the necessary qualifications for the practice of medicine. They, furthermore, established free dispensaries to treat the sick poor and supply them with the required medicaments. But, in spite of every effort on their part, the apothecaries proved triumphant. In 1606 the apothecaries, for their mutual protection united with the Company of Grocers and were licensed for the first time under that designation. In 1617 they left the Grocers and formed a company of their own, known as the Apothecary's Society, or Hall. They then secured an Act of Parliament whereby every practitioner of medicine without exception, medical graduate or otherwise, should be required to open a shop for the sale of drugs in connection with his practice; and also to serve a five years' apprenticeship with some approved apothecary (a law since repealed). It will be observed here that the tables were now turned. For many years the apothecaries had in their hands the whole control of medical matters.

The apothecary was a general practitioner, at first, as regarded special medical training, somewhat inferior to the graduate in medicine. By the requirements of the Act above-mentioned he was to attend the sick at his office, or surgery, and at their homes, prescribe in both places, vend drugs and medicines and fill orders on the prescriptions of the regular profession.

The requirements for an apothecary's license were not at the outset very extensive. The young apothecary received no instruction apart from that which the Master-Apothecary could teach him—a brief knowledge of drugs and medical botany and the preparation of medicines. From time to time the Apothecary's Hall would prescribe certain courses of study besides that given by the Master-Apothecary, which at length included some attendance on lectures at some approved medical institution. And, in 1878, by Act of Parliament the medical requirements for a license to practice physic and surgery were made more stringent and applied to all classes of practitioners without exception. So the only difference existing between the English apothecary

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and the rest of the medical profession, is one in name only and in the fact that the latter supplies his own medicines. He is also permitted to sell drugs and medicines and to prescribe at his surgery, but is not allowed to make two charges for advice and treatment. One fee includes both.

A word now remains to be spoken with regard to the druggists and chemists proper, the pharmacists, in their relation to the medical profession. In 1790 this class of dealers came into existence and endeavored to follow in the same steps as did the apothecaries, even going so far as to attend the sick at their houses.* They had no license for such practice and hence came in conflict with the apothecaries. They pursued the identical course which the American pharmacists are evidently following, for counter-prescribing alone constituted an infringement of the medical law. This practice aroused the violent opposition of the apothecaries who considered that their licensed privileges had been encroached upon. Accordingly they took shelter under the wing of the Royal College of Surgeons and, in conjunction with that body, in 1815, obtained an Act of Parliament in their favor, whereby all druggists and chemists were forbidden to treat the sick in any manner and to confine their business strictly to the vending of drugs and medicines and the compounding of physicians' prescriptions. The apothecaries thus came off victorious, and the question has never been opened since. The privileges of all classes of practitioners and pharmacists have been settled permanently.

There is no conflict between the physician and the apothecary, or between those two and the chemists. The position of each is perspicaciously defined by Act of Parliament.

These points are interesting from the fact that the registered pharmacists with us seem to be passing through an apothecary stage, whatever may be the attitude of the practicing physician. Their methods have not as yet aroused any direct opposition from that quarter. Whether the physicians will meet them half-way, or whether they finally will be forced to refrain from their irregular methods, future development only will show. It is high time, however, for the medical profession to test the law and to determine their own standing and privileges.

* A similar course was actually attempted by the pharmacists of Pennsylvania some twenty years ago, though unsuccessful then.

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A PHOTOGRAPH OF THE HEAD OF CARDINAL RICHELIEU TAKEN TWO HUNDRED AND FIFTY YEARS AFTER DEATH.

By Fredric Griffith, M.D.,
New York City.

THE photograph of a man's head whose influence in France until this day is greater than even the genius of Napoleon could leave behind is deserving of at least a momentary interest if only as a pathological specimen.

Armand Jean du Plessis Richelieu—duke and cardinal by title, king of France and manager of things temporal in Europe in verity—was born in Paris, September 5, 1585. He died at the French capital on December 2, 1642. What he accomplished during his lifetime of fifty-seven years may be learned by a study of Paris, France, and the French. The goadings he suffered from chronic indigestion, chronic insomnia, chronic erysipelas and general arterio-sclerosis is not generally known. Besides disease he bore treatment. During one year he was bled forty-seven times, took two hundred and twelve medicines and was induced to try, besides, two hundred and fifteen other remedies.

"Monseignor, in twenty-four hours you will be dead or cured."

"That is the way to speak," said the dying man to the hovering leeches, one of whom had at last summoned the courage of a prognosis to this builder of his own fortunes, stricken with that malady of great mind in a puny body. During Richelieu's time doctors, by law, rode upon saddleless donkeys. Thus the ass's back bore loads of great wisdom and learning.

Beneath the floor of the church of the Sorbonne, in the heart of the Latin Quarter, Richelieu's body rested for two centuries and a half. Above, the tramp and scuff of many feet wore away the stones. A revolutionary with a pike struck off the nose of the carved stone Richelieu but the "Terror's" populace swept on and left the remains below undisturbed.

In 1895, repairs made necessary by the settling of the tomb, caused the removal of a small slab giving a partial view of the interior. By chance a photograph of the cardinal's head, wasted by the ravages of time but still bearing some semblance to the living contours was made possible by the use of a flash-

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PHOTOGRAPH OF THE HEAD OF CARDINAL RICHELIEU TAKEN 250 YEARS AFTER HIS DEATH.

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light. The picture was obtained by me in Paris during the summer of 1905 from the warden of the Sorbonne. It is an original from the single plate made in 1895.

EXPERIENCES OF AN AMERICAN PHYSICIAN AT THE CAPTURE OF WASHINGTON BY THE BRITISH IN 1814.

By Albert Allemann, M.D.,
Army Medical Museum, Washington, D. C.

IN 1816 Dr. James Ewell, of Washington, published a book entitled "The Medical Companion," which he dedicated to Thomas Jefferson. The book itself has now little scientific value, but the author added to his work "A concise and impartial account of the capture of Washington, and the diseases which sprung from that most deplorable disaster." It is this really vivid account of the capture of Washington which is of considerable historical interest, especially as its author, who was an eye-witness, differs in many ways from the usual accounts of our historians. Our author shows the British officers and soldiers in a much more favorable light than they appear in the traditional accounts of that unfortunate event.

Dr. Ewell was at that time practicing medicine in Washington, to which city he had removed from Savannah, Ga. His writings prove him to have been a man of exalted patriotism, a man proud of his country and its freedom, and withal a perfect gentleman. The author begins his account with a severe criticism of the men who should have provided the means for the defense of the capital. Indeed, from his account, the negligence and carelessness border on criminality. I mention only the fact that a whole regiment of Virginians under Col. Miner, present in Washington, could not be sent on the field of battle, because the War Department had failed to provide the soldiers with flints for their guns.

We may imagine the extreme anxiety and suspense of the people of Washington during the engagement at Bladensburg. The author "beheld the rockets ascending between 12 and 1 o'clock and soon heard the roar of cannon." But, after a short but severe engagement, the few raw militia troops had to give

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way before the British veterans, and retreated towards Washington.

The people of the capital greatly feared excesses of the victorious soldiery. Dr. Ewell removed his wife and two daughters to the house of a sick lady friend, thinking they would have better protection there. About twilight the British troops marched on Capitol Square and took possession of the city. During the night a servant came to Dr. Ewell to inform him that his abandoned house had been plundered by British soldiers. Soon after, the doctor was introduced to General Ross, the commander of the British army, who just then learned that Ewell's house had been plundered by the soldiers. "In a tone," continues Dr. Ewell, "that will forever endear him to me as a perfect gentleman, indeed, he observed he was very sorry to hear that my house had been disturbed, and begged me that I would tell him which it was, and he would order a sentinel to guard it." Now it happened that General Ross had intended to make that same house his headquarters, but as soon as he learned it was Dr. Ewell's house, he at once gave up this intention, though Dr. Ewell urged him to stay with him. "He refused for some time to accept of it, and insisted I should go and bring Mrs. Ewell home, observing that I might depend upon it, my family should be just as safe as they were the evening before, when the American army was here, for, continued he, I am myself a married man, have several sweet children, and venerate the sanctity of the conjugal and domestic relations."

As soon as Mrs. Ewell with her two daughters came, the British commander went to meet her. "The General shook her hand with every mark of undissembled friendship, expressed his deep regret to learn that she had been so seriously frightened, and lamented sincerely the necessity that had given cause to these tragedies, namely, the burning of the British capitol in Canada." But Dr. Ewell, in defense of his country, adds in his account: "Had the capitol of Canada been burned with the approval of our Government, there might have been some apology for the shameful destruction of our noble buildings."* When the doctor observed that it was a great pity

*In justice to General Ross it should be mentioned here, that he had orders from the British Government to burn the capitol in retaliation for the burning of the capitol of Canada by the American invaders.

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the elegant library had been burned with the capitol, General Ross replied with much concern: "I lament most sincerely I was not apprised of the circumstance, for had I known it in time, the books would most certainly have been saved.

"All generous Americans," the doctor continues, "will doubtless pronounce Major-General Ross a magnanimous enemy. Surely the instances already cited, prove his claim to that high character; and surely he deserves it, who, when told that our barracks, which according to the usages of war he had condemned, could not be burned without injuring private property, immediately countermanded his own order, and thus saved to us that noble range of buildings."

Dr. Ewell took a very active part in caring for the sick and wounded, British as well as American, and as there were no funds at hand General Ross gave him a considerable amount of money, all he had, to provide for the necessities of the wounded. By mere accident Dr. Ewell heard that John Stockton, of the rifle corps from Baltimore, commanded by the gallant Major Pinkney, had lain for two days desperately wounded on the battlefield. "I pressed a cider cart from the country," he says, "and had him brought in, extracted the ball, dressed his wounds, and plentifully supplied him for several weeks from my table."

During the occupation of Washington a most tragic accident happened to a company of British soldiers. They marched down to Greenleaf's Point to destroy a powder magazine. But the magazine had previously been emptied and the powder thrown into a dry well. The soldiers, not knowing of this fact, threw a lighted match into the well and a tremendous explosion occurred. All the officers and about thirty of the men were killed and forty-seven soldiers seriously injured. The crippled and wounded men were brought to Washington where a house on Capitol Hill was prepared for their reception.

When General Ross learned of the disaster he was exceedingly chagrined and said to Dr. Ewell: "I am much distressed at leaving these poor fellows behind me. I do not know who is to mitigate their sufferings." "The Americans, General Ross," said Dr. Ewell, "are of the same origin with yourself. We have, I trust, given you many splendid instances of our humanity in the course of this unfortunate war, and you may rely upon it, sir, no attention in my power shall be withheld

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from them." General Ross was deeply moved by these kind words and promised to see that the doctor would be rewarded for his work. On the same evening the British general left Washington with his army. Assisted by Dr. Baker, of Georgetown, Dr. Ewell took charge of the British wounded and of a large number of Americans who were in the same hospital. A number of Americans died of bilious fever while only one of the British, Dr. Monteith, succumbed to this disease. It is curious to note that a number of adopted citizens, who had emigrated to this country from the British Islands, were enraged against Dr. Ewell for his humane treatment of the British wounded; they called him a traitor and even threatened him with violence. On the other hand, many of the most prominent citizens of Washington, among whom were Charles Carroll, Ringold, General Van Ness, etc., praised Dr. Ewell for his generous and unselfish work and several went to his house and thanked him "for an act so honorable to the character of the American people."

Fate so would have it that General Ross was not permitted to fulfil his promise to Dr. Ewell. He was not to see his family again. He died a hero's death on September 12th, in a skirmish near Baltimore. Having distinguished himself in many campaigns, in Holland, Italy, Egypt, Spain, he had promised his wife, before he left England for America, that this should be his last campaign, and so it proved.

With these few extracts this short article may close. The whole interesting narrative deserves to be published *in toto,* but these few extracts may suffice to portray in Dr. James Ewell a noble type of the American physician of the beginning of the past century, and in General Ross a grim soldier, indeed, but at the same time a man of a most kind and tender heart, a man of the stuff of which the true hero is made.

"Whatever illustrates the progress of the human intellect, and the achievements of those who have preceded us, is, at least, a subject of legitimate curiosity to every man who desires to elevate his mind to the dignity of his actual condition."—*Meryon.*

"Who knows whether the best of men be known: or whether there be not more remarkable persons forgot than any that stand remembered in the known account of time?—*Sir Thomas Browne.*

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ON UNION IN MEDICINE.

With Some Reflections on the Present State of Homeopathy and Homeopathic Literature.

By Peter Scott, M.D.,
Brooklyn-New York.

AT a recent meeting of a County Medical Society a resolution was presented to the members, the purpose of which was to admit homeopaths and eclectics (under certain conditions) to membership. It was evident that a discussion of this question was deemed untimely by some of the more prominent members of the Society, as a motion to postpone such discussion indefinitely was quickly passed, no one dissenting. The question, however, has been raised, and it is not the first time that the idea of a united medical profession has been suggested. It was mentioned recently in the farewell speech of Dr. Osler, at Baltimore. "Squabbles about drugs," said he, "should no longer separate men with the same hopes."

During the last twenty years, in fact since he came to this country, the writer has made use of homeopathic medical literature. He has never taken it seriously, but rather has used it in the same way as he might use Don Quixote, Alice in Wonderland, or Mark Twain. In that short, quiet hour just before midnight, when the house is still, if too tired for the latest number of a scientific journal, what more handy or more amusing reading than any of the three mentioned above, to which the writer would add homeopathy? And some parts of homeopathic literature are just as amusing as "The Hunting of the Snark," and as closely related to the trend and spirit of modern medicine as Don Quixote was to the stern realities of life. This, however, does not apply to all homeopathic literature, nor even to the greater part of it.

Using three recent volumes of *Transactions of the Homeopathic Medical Society of the State of New York*, it will be found that from one-half to three-fourths is made up of papers and addresses by men who are evidently *true students of medicine* in the best sense of these words. This is particularly noticed in those articles devoted to the specialties, Eye, Nose, and Throat. In these articles the subjects discussed are treated in

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no way different from that in which they would be discussed in any other medical work. Dr. F. P. Lewis, of Buffalo, speaking on this subject, says:

"Still more startling is the volume of the Homeopathic Ophthalmological, Otological and Laryngological Society for the year 1899. The Society consists of one hundred and fifty members. The volume is a bulky quarto of 326 pages. Among the entire number of papers is found *not one lone essay* upon the single subject that gives the Society a right of separate existence."

This address by Dr. Lewis (*Transactions,* 1900) is full of common sense and well worth reading by any one interested in a united profession.

If, then, the homeopaths who are practising specially on the eye, ear, or throat, are willing to admit that in treating the diseases of these organs, homeopathy is of so little use, that when they come together to discuss their work, or when they write papers for publication on their work, they can do so without any reference to homeopathy, surely it is time for the other side to yield something, and admit such fellow-workers as are willing to make such admissions, into their meetings and associations. And what has been said in regard to the eye or ear surgeon, can surely be said of the general surgeon. We have laughed heartily over the absurdity of homeopathic surgery; and it is no less absurd in 1906 than it was in 1886; but let us forgive and forget, and if a man is a surgeon and doing good surgical work, and, further, if he is willing to admit that surgery has nothing to do with a certain law or rule for the choice of drugs, then he should be admitted to the society of others doing the same work and having the same hopes. The question of how and when to trephine the skull, or of the best method for relieving an enlarged prostate has as much to do with the doctrine of homeopathy as it has to do with the doctrine of transubstantiation.

Supposing all this to be accomplished and the doors of the County Society opened to all those homeopaths practising a specialty, or practising general surgery, with the condition that they are willing to drop any further reference to sectarianism; and supposing also that this invitation was accepted by any considerable number of them, it would still leave a majority of the homeopaths outside the County Societies who would still

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meet and support their own county societies. Little might be accomplished at first in the way of a united profession, but much would be accomplished in the course of time.

A careful study of the homeopathic literature of the last decade shows that "the attention of their best minds is being occupied more with the important collaterals than with specific therapeutics" (Lewis. *Trans.*, 1900). This is so marked in the volumes of transactions under consideration that one can divide the papers and addresses into two classes. *First,* those on special subjects, for ordinary serious reading and study; and *second,* those on therapeutics, materia medica, and boasting, for light reading and amusement. These two classes of papers indicate two classes of men, *viz.,* those who have little or no use for the law of similars and drift into other work, more congenial, more satisfying, more profitable, and more in agreement with the spirit of modern medicine; and second, those who are enamored with the law of similars, and adhere to it more or less. If the doors of the County Societies were opened to those of the first class, and if any considerable number of that class joined the County Societies, then those remaining, though the majority, would find that their most intelligent members had left the homeopathic fold. It would take some time, however, to overcome certain, always admirable qualities possessed in plenty by homeopaths as by members of other societies; that is, pride of association, pride of Alma Mater, and *esprit de corps.*

Dr. Similia, whose grandaunt believed in homeopathy and paid all his expenses while he studied medicine at the homeopathic medical college, may by the time he is forty have given up general practice and homeopathy, to take up diseases of the eye or ear without homeopathy. He may admit, with Dr. Moffat, that "our homeopathic literature is full of trash, clinical and pathogenetic assertions in place of demonstrations" (*Trans.,* 1903); or with Dr. Lewis, "that not a single distinctly homeopathic fact has been added to our therapeutic armamentarium during the past twenty-five years" (*Trans.,* 1900).

Even though his medical college was not *his* choice, but depended on the whim of an amiable old lady, who, like many others of her class and time, believed in homeopathy, he may have enough *esprit de corps* to resist his later matured convictions and adhere to his earlier associations. If, however, his matured convictions were strong enough to lead him to the doors

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of the so-called regular societies he would find these doors closed to him.

Were the question a matter of religion and not a matter of medicine the case would be different; for just as soon as Dr. Calvin is convinced that his fond parents were mistaken in bringing him up a Presbyterian it would matter not which way his mind turned, he would find doors open on all sides: Catholic or Universalist alike would be ready to receive him. Are the medical societies to be outdone in generosity and liberality by the churches?

There remains the question: What to do with the others? with the immediate expected answer from the others that "they can take care of themselves, and have no wish to be interfered with."

The mental attitude of the physician who believes in and makes use of homeopathy towards the other physicians who do not believe in homeopathy is a difficult one to picture. Our friend, "The Gentle Reader," has recently written a very entertaining essay on the West, treating the West as a state of mind, rather than as a locality or territory. He says: "Just where the geographical West begins it is not necessary to indicate; but the psychological West begins at the point where the center of interest suddenly shifts from the day before yesterday to the day after to-morrow." In like manner we might treat homeopathy as a state of mind rather than as a therapeutic law. It begins where the center of interest suddenly shifts from the modern sciences upon which the art of the physician is founded to the divine transcendental law promulgated by Hahnemann, the dogmatic theologian.

Now it is to be admitted that the modern homeopath is well trained in the modern sciences, but that just explains the difficulty of the present-day homeopath. It explains also the oft-repeated theme of discussion among homeopaths: Are we on a scientific basis or are we not? At one time the mind of the homeopath may be dominated by his scientific training, and at another time equally dominated by the transcendental law of Hahnemann. He may believe in the lessons learnt from Pathology, or he may openly assert that Pathology teaches him nothing. He may study Bacteriology and make use of its teachings, or he may openly sneer at the fellow who finds a new germ for every disease. Under the influence of his scientific training he accepts vaccina-

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tion as a valuable measure against smallpox; but under the influence of the divine law of similars he proposes the use of vaccine virus administered internally after being triturated. (*Trans.*, 1904.)

There are two things, however, that he does always. *First*, he continually keeps before his mental vision a certain bogey that he calls the Allopath; and *second*, like one of the great political parties, he claims everything. A reduced death rate during the last five decades, the introduction and use of antitoxin, and, in fact, every advance made in the great field of practice of medicine, all alike are claimed by the homeopath. Up to the present date the extraordinary success of the medical corps of the Japanese army in preventing disease has not been claimed by homeopathy, but that will come. "The success of the Japanese army in the late war was largely due to hygienic methods. The whole field of hygiene is open to the homeopaths, and they constantly make use of hygienic methods; therefore the success of the Japanese army was wholly due to homeopathic methods." Some student of Whately or Jevons may call this bad logic and prate about an undistributed middle, but it really is good homeopathic logic.

As there are collections of gems from the poets, and gems from the operas, so we might have a volume of gems from the homeopaths, admitting at the outset that isolated sentences do not always represent fairly or altogether the best thoughts of a writer; but a few may help to illustrate the mental attitude of the modern homeopath.

On the Use of Antitoxin:—

"We must take to our credit the real, wonderful treatment of diphtheria by antitoxin. It is the most scientific, it is the most successful, it is the most sure cure of the medical profession to-day. We know what produces diphtheria and we take it. That is the general principle that Hahnemann taught." (Gorham. *Trans.*, 1900.) In the discussion that followed one stated "that he had tried to '*prove*' antitoxin, but got symptoms of carbolic acid." Another said: "It is antidotal;" and a third: "It can never be shown that the use of antitoxin is homeopathic."

On Bacteriology:—

"To know that a bacterium is causing a disease is of far less moment than to know of a drug that will cure a disease." (Van Denburg. *Trans.*, 1900.)

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On Diet:—

"Fifty years ago every homeopathic patient was dieted no matter what the disease, while dieting was almost unheard of among the Allopaths, except for diabetes and maybe for dyspepsia." (Moffat. *Trans.*, 1900.)

On Their Attitude Towards the Allopath:—

"We differ from all other schools in having a scientific basis for the application of drugs in disease. They are one and all without a clear, reasonable and comprehensive method of procedure, based upon experimental data and of logical and universal application." (Van Denburg. *Trans.*, 1900.)

"The Allopathic school is no more friendly to us now than it was in the past. It is fear alone that keeps it even civil." (Butler. *Trans.*, 1900.)

"Let us lose no opportunity to impress upon all this fact, that it is the Allopaths who are the sectarians just in so far as they close their minds against homeopathy." (Moffat. *Trans.*, 1903.)

"Ultimately a fair and thorough course of instruction in homeopathy will be an essential, not an optional part of the curriculum in each old school medical college." (Moffat. *Trans.*, 1903.)

"The Board of Health of this city [New York] employs eighty physicians to treat the sick babies of the town. These physicians carry their *poisons* with them, and are compelled to visit forty each day. I think I am warranted in considering it a result of this plan that this summer, the coolest we have had in years, the death rate among children has increased two to a thousand over previous years. It is a matter for us to think about and see if we can check it." (Applause.) (Seward. *Trans.*, 1904.)

"I think the action of the Board of Health in that matter is to a very large extent unwarranted." (Hamlin. *Trans.*, 1904.)

On Statistics and Boasting:—

"I also notice that through the efforts of our graduates the miasms are robbed of their terrors, hereditary weakness eliminated from the constitution, and malignancy eradicated from epidemics; consequently the greater average of life is attained, the larger degree of usefulness, and the addition of beauty of form and healthfulness of character." (Custis. *Trans.*, 1900.)

"Fewer days are lost to the community by sickness. Our

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patients *pari passu* recover full health sooner than do those under allopathic treatment. They have comparatively no stage of convalescence; their stomachs have not been deranged by medication.

"People who have been habitually under homeopathic treatment become less and less susceptible to infection or contagion. The decrease in mortality under homeopathic treatment is one of the most marked effects of homeopathy upon the public health. Could our (Homeopathic) forefathers know with how many of us the homeopathic prescription was but an exception they would writhe in their graves." (Moffat.)

These last few sentences are from page 278 of the *Transactions* for 1900. It is to be hoped that by this time the homeopaths are busy writing homeopathic prescriptions, and making that the rule rather than the exception. For if they know how to increase the average length of life, and the duration and quality of health, and if they know how to reduce the susceptibility to infection and contagion, and yet do not put that knowledge into use, then they are guilty of a great wrong, and the spirits of not only the homeopathic forefathers, but of all good men, are likely to turn in their graves if they knew of it. It is never too late to mend; and to writhe in a grave must be very uncomfortable.

In fairness, and so as to show that all the gems are not of this quality, the following are given by way of contrast:

"The homeopathic specialist has become less and less a pure therapeutist, and his practice in many instances has become practically that of his old school colleagues." (Lewis. *Trans.*, 1900.)

"*Nolens volens* the homeopathic specialist must confine his work very largely to mechanical and surgical measures, and then his homeopathic designation is an absurdity." (Lewis. *Trans.*, 1900.)

"A well-defined conception of the so-called homeopathic law does not exist to-day in the minds of the physicians practising homeopathy." (Wanstall. *Trans.*, 1903.)

"If a drug has an action it is the action of that drug. If it is iodide of potash given in the twelfth, the thirtieth, or any other potency, whether prescribed homeopathically, antipathically, or allopathically, or any way you please, that drug is iodide of potash, and if it cures disease, it cures disease in only one way." (A. Wanstall. *Trans.*, 1903.)

"We claim to cure more, more quickly, and more gently than

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they do in other hospitals. During the century just begun hospitals of all schools are the sources from which alone true information as to best methods of practice can be obtained. When we publish such statistics we naturally challenge other therapeutic methods to publish theirs. And when this is done—and not before—will any fair comparison between therapeutic methods be possible, and, until such comparisons are made, all other arguments and party strife are more than purposeless—they are ridiculous." (C. Wesselhœft. *Trans.*, 1900.)

If the spirit of fairness and wisdom indicated in the above from the late Dr. C. Wesselhœft were common to partisans of both or all schools, then union between the schools would be almost an accomplished fact.

The question then is: Shall we unite? or, Can we unite with men holding such views as have been quoted? In a matter of this kind progress can only be made through compromise. If the homeopath is asked to give up his transcendentalism, is there nothing to be given up by the other side, or is orthodoxy one-sided in this case?

Should the time ever come when the two schools can unite without loss of self-respect, there is still one aspect of the question that is worth noting. "It is a far cry to Loch Awe," and it seems going far afield to refer now to the recent church question in Scotland. The amount of interest in America taken on this matter of the churches in Scotland was indicated by the space given to it in such papers as the *Outlook* and the *Independent*. Briefly stated, it was something like this:

Previous to 1900 there were besides many minor varieties of Presbyterians, three principal bodies or varieties: the Established Church; the Free Church; and the United Presbyterian. The value of a union between any two or all three of these sects was every year becoming more apparent, and towards the end of the last century everything was arranged between the Free Church and the United Presbyterian Church for a union, the new Church to be called the United Free. This union had only become possible during the last twenty or thirty years through a very distinct broadening of religious views, more especially in regard to certain Presbyterian dogmas, the nature of which need not detain us. The very best legal advice had been obtained, and the number of those opposed to the union was so insignificant that it seemed as if nothing

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was in the way of the desired end. Here was another case showing that

> "The best laid plans o' mice and men
> Gang aft aglee."

Those opposed to the union, composed of some twenty clergymen from twenty-five thinly peopled parishes in the highlands or northern counties of Scotland, objected, carried their case to the courts, and eventually to the House of Lords. There, in the highest court in all the land, it was decided that these few adherents of ancient dogmas were legally entitled to all the property of the Free Church. The church property, consisting of three colleges, one in each of the three principal cities in Scotland, all the Free Church buildings throughout Scotland, much property abroad at foreign mission stations, the whole valued at about twenty-five million dollars, all belonged now to those few who still adhered to the dogmas in vogue when the Free Church seceded from the Established Church. It was pointed out and it was admitted that the few Northmen so suddenly enriched with Church property were not in a position to administer, and not capable of administering the property; but that plea was dismissed. It was pointed out that the greater bulk of the property and endowments had been acquired during the later years when adherence to these dogmas was not deemed essential either by the clergy or laymen, and that plea was also dismissed. The whole matter created much discontent among all classes in Scotland, and it was necessary for Parliament to take the matter up and adjust it to the satisfaction of all; and it all goes to show:

First, that what is dogma to-day may be anathema to-morrow.

Second, that when Benevolence endows colleges, religious or medical, with moneys or property to be used in the interests of a dogma, then Benevolence is blind as to the future. And

Third, that when union between the Schools of Medicine is about to become an established fact, then the true real homeopaths will step forward and claim that they are the true adherents of that doctrine and are entitled to all the property, hospitals and colleges, inasmuch as they were built and endowed for the purpose of teaching or practising that doctrine.

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A BIOGRAPHY OF FRANÇOIS MAGENDIE.

(*Continued.*)

By Percy M. Dawson, M.D.,
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THIRD PERIOD, 1821-1855.

JOURNAL AND CONTROVERSY.

The Journal of Experimental Physiology, 1821-1831.

IN Paris during the early part of the last century many new medical and scientific periodicals were added to the considerable number already in existence. The facilities for the publication of work in physiology and experimental medicine seem to have been excellent, and Magendie at first availed himself of them. He contributed to the *Journal Universel des Sciences Médicales,* the *Nouveau Bulletin de la Société Philomatique,* the *Annales de Chimie et de Physique,* the *Nouveau Journal de Médicine, etc.,* but chiefly to that famous periodical edited by Boyer, Velpeau and Leroux in which five of Magendie's monographs appeared. There was, however, at that time no journal devoted exclusively to experimental medicine, and probably it soon appeared to Magendie that there was room for such a publication. Be this as it may, in June, 1821, appeared the first number of his *Journal de Physiologie Expérimentale,* or, as it was subsequently called, *Journal de Physiologie Expérimentale et Pathologique.*[28]

From the title-page of this new journal we learn that at this time Magendie was physician of the central bureau of admissions to the civil hospitals and infirmaries in Paris[29], member of the Philomathic Society, of the Société Médicale d'Emulation, and also member of the medical societies of Stockholm, Copenhagen, Wilna, Dublin, Philadelphia,[30] etc.

The introduction to the first number, which is here partly

[28] *Journal de Physiolgie Experimentale et Pathologique* is the title of vols. II to X inclusive.

[29] Magendie received this appointment July 18, 1818.

[30] To this list were added, in 1824, member of the Royal Medical Society of Edinburgh, and the Reale Accademia dell' Scienze di Torino, and, in 1827, Physician to the Hôspice de la Salpêtrière and Consulting Physician to the Col. royal de Henri IV. In the first few vols. the address of the editor is given, "Rue de Seine, No. 30."

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quoted and partly paraphrased, runs as follows: "The two centuries which have just closed have seen the birth and growth of the physical sciences. The task of the early discoverers was twofold. In the first place they had to make the actual discoveries, and in the second they had to overcome the prevailing prejudices. Experimental physiology began with the discovery of the circulation of the blood in the seventeenth century, but it has not progressed with the same rapidity as astronomy, physics and chemistry, perhaps because in this field there have been no geniuses such as Galileo or Newton, perhaps because popular prejudices have been stronger here than in the case of the physical sciences.

"What subject indeed is more fertile in gross errors and absurd beliefs than that of health and disease? Consider the painful disquietude you would produce in the minds of the majority of men if you said to them: *'There are no such things as rheumatismal humour, gouty humour, scabby virus, venereal virus, and so forth. Those things which are so designated are imaginary things, which the human mind has created to hide from itself its own ignorance.'* The chances are that you would be taken for a lunatic just as it but recently befell those who maintained that the sun was immovable and that the earth turned.

"Having taught this science [Physiology] for fifteen years, cultivating it through choice, and having resolved never to separate it from practical medicine, because I regard it as the best guide to follow in a great number of maladies, I believe that I would be doing something useful in publishing a periodic work designed to contain all facts which tend to throw light upon the history of man in health and in disease. I shall receive therefore with acknowledgment and place in the collection which I now announce, all physiological work, all medical researches which, based on precise observations, exact experiments and controlled by a spirit of severe impartiality and love of truth, appear to me to be suitable for illuminating the phenomena of life.

"One advantage which distinguishes the majority of journals devoted to the physical sciences is that they are edited by savants who strengthen such publications by enriching them with their own discoveries, and who are therefore at the same time more competent to judge the work of others. The works which I have published in medicine and physiology give me, perhaps, some claim to the confidence of the public.

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"The *Journal de Physiologie Expérimentale* will consist of four numbers per annum, which will appear regularly every three months. Each number will contain six sheets in octavo, more if the material be abundant. Plates will be added when deemed desirable. Subscription, 12fr. per annum."

By way of "enriching" the journal "with his own discoveries," Magendie contributed thirteen articles to the first volume. Some of these, however, were only reprints of his former publications, added, doubtless, to complete the "six sheets in octavo." Such padding soon became unnecessary and the editor's articles became fewer and fewer. That the number should have fallen off is not surprising. Indeed it seems wonderful that he could have found time to contribute at all, since he systematically verified all results of experiments sent to him for publication, as would appear from a foot-note in one of the early numbers of the journal in which he asks his contributors to send in their articles at least one month in advance that he might have time to verify the principal experiments before sending their accounts to the printer.[31] Moreover, Magendie's literary activity was not confined to editing his journal. He re-edited Bichat's "Researches on the Phenomena of Life and Death," 1822, (36) and his "Treatise on the Membranes," 1827, (60) both with commentaries. He also re-edited, with considerable additions, his own book on gravel (1828). In 1825 he published with Desmoulins an "Anatomy and Physiology of the Nervous System" (52). In 1823 and 1828 appeared his two memoirs, on the Nervous System, and on the Brain, and finally, the second edition of his Text-Book and the second to seventh editions of the Formulary.

Thus founded, the *Journal de Physiologie Expérimentale* led a flourishing existence for eleven years. Kergaradec's celebrated memoir on the auscultation of the fœtal heart appeared in the second volume, while among the best known contributers were Andral, Breschet, Velpeau, Poiseuille, Flourens and Bernard. Financially, the journal met with " a success," wrote Magendie,[32] "which I had hoped for only with time; I had even deposited the funds necessary for supporting it for several years. But this precaution was needless; with the second number the expenses were covered. I am doubtless very much flattered by

[31] J: I, p. 101.
[32] J.

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this result, but I also sincerely congratulate the friends of science, especially those who wish to see medicine depart from that state of imperfection in which it has been up to our day, and in which many persons through prejudice or other less excusable motives are compelled to maintain it." He adds: "I have never intended that this publication should be of the nature of a financial speculation; I have devoted the profits to perfecting the work."

It would be tedious to give even in outline the contents of Magendie's numerous contributions to the *Journal*, tedious even to give in full their titles, for there were twenty-six of them, not counting editorials and reports; but for the purpose of emphasizing the wide range of his investigations, an enumeration of some of the subjects treated will not be unprofitable.

There were five articles[33] on human and comparative anatomy, six[34] on the special senses and peripheral nerves, eight[35] on the central nervous system, six[36] on the physiology and surgery of the circulation, six[37] on clinical medicine and therapeutics, two[38] on hydrophobia and, finally, a description[39] of two new sorts of gravel. There is, however, one series of articles which is worthy of especial attention, for not only were the experiments therein described of extraordinary importance, but their publication gave rise to a well-known and rather bitter controversy. The discussion of this topic will, however, be reserved for a separate sub-section.

The Bell-Magendie Controversy, 1822 and 1847.

In the third number of Volume II of his *Journal* occurs one of Magendie's most noteworthy contributions to physiology, namely, his article on the functions of the spinal nerve roots (40).

"For a long time," he writes, "I had wished to perform the experiment of cutting the anterior and posterior roots of the nerves arising from the spinal cord of an animal." Having secured a litter of pups Magendie laid bare the cord. "I had then before my eyes the posterior roots of the lumbar and sacral pairs, and, raising them up successively on the blade of a pair

[33] See Appendix: 28, 29, 33, 34, 38.
[34] *Ibid.*: 40, 41, 49, 50, 54, 65.
[35] *Ibid.*: 25, 45, 46, 47, 51, 53, 61, 67.
[36] *Ibid.*: 24, 26, 30, 31, 32, 63.
[37] *Ibid.*: 35, 37, 55, 58, 66, 68.
[38] *Ibid.*: 27, 48.
[39] *Ibid.*: 59.

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of small scissors, I cut them on one side. . . . I reunited the wound by means of a suture through the skin and observed the animal. I thought at first that the member corresponding to the cut nerves was entirely paralyzed. It was insensitive to pricks and to the strongest compression; it also appeared to me to be immovable; but soon, to my great surprise, I saw it move perceptibly, although sensibility was always entirely absent. A second and a third experiment gave me exactly the same result. I began to regard it as probable that the posterior roots of the spinal nerves might have different functions from the anterior roots, and that they were particularly designed for sensibility."

Then, with considerable difficulty, Magendie succeeded in cutting the anterior roots. "As in the preceding experiments, I made the section on only one side. . . . One can imagine with what curiosity I followed the effects of this section. The results were not doubtful; the member was completely immovable and flaccid, although it preserved an unequivocable sensibility. Finally, that nothing might be neglected, I cut at the same time the anterior and posterior roots; there was a complete loss of sensation and motion. . . ."

"I am following up these researches, and will give a detailed account of them in the next number. It is sufficient for me to be able to affirm to-day as positive, that the anterior and posterior roots of the nerves which arise from the cord have different functions; that the posterior appear to be more particularly devoted to sensibility, while the anterior appear more especially associated with movement."

As promised by Magendie, the next number contains a second article on the same subject, entitled, "Experiments on the function of the roots of the nerves which arise from the spinal cord."(41) In this communication the author states that, having become curious to know what the effect of cutting the dorsal or ventral roots would be upon the convulsions caused by strychnia, he proceeded to decide the question by means of experiments. These consisted in unilateral section of one or both sets of the nerve roots supplying the hind leg. As might have been expected, in the leg of which the dorsal roots had been cut, the tetanus was just as complete and intense as when these roots were left intact; while, on the other hand, in the leg of which the ventral roots had been cut, the muscles remained lax and motionless.

The publication of these articles at once gave rise to what

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is known as the Bell-Magendie controversy, for it was asserted that Magendie had done no more than confirm and elaborate the experiments already performed in England by Sir Charles Bell.[40] The basis of the claim made for Bell was a pamphlet printed by him in 1811 and entitled, "Idea of a New Anatomy of the Brain, submitted for the observations of his friends."[41] This work was never intended for general distribution, but was privately circulated among Bell's friends. In it the author described the following experiment:

"On laying bare the roots of the spinal nerves, I found that I could cut across the posterior fasciculus of nerves, which took its origin from the posterior portion of the spinal marrow, without convulsing the muscles of the back; but that on touching the anterior fasciculus with the point of the knife, the muscles of the back were immediately convulsed."[42]

From this experiment Bell concluded that the dorsal and ventral roots have different functions, but in the nature of these functions he was mistaken, for he supposed that upon the ventral roots depended not only motion but also sensation, while to the dorsal roots he attributed the function of control of the growth and sympathies of the parts.

In the interval between his first and second communications, Magendie had been made aware of the existence of this pamphlet, and consequently he was able to add to his second article the extract from Bell's work which has been quoted, and concluded with the following comment with regard to it: "M. Bell, led by his ingenious ideas regarding the nervous system, has been very near discovering the functions of the spinal roots."[43]

The dispute never took on an international character, for although the claim of Bell was taken up in England with considerable vim and venom by John Shaw, one of Bell's pupils, several English authors gave unqualified preference to the claim of Magendie. Mayo,[44] for example, wrote in his text-book, "Mr.

[40] John Shaw stated that M. Magendie "corroborated some experiments which had been previously made in this country; but of the performance of which M. Magendie does not appear to have been aware."—*London Med. and Physical Journal*, 1822, xlviii, p. 343.

[41] *Lond.*, [*1811*]. 36 pp. 8vo.

[42] *Loc. cit.*, p. 22.

[43] J: 1822, ii, p. 371.

[44] Herbert Mayo. "Outlines of Human Physiology. 3 Ed. London, 1833, p. 255. See also: *Med. Times and Gazette*, London, July-Dec., 1855, N. S., xi, p. 558.

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Bell was carried by his experiments very near the truth, but he failed at that time to ascertain it. . . . Before Mr. Bell published any other account of the function of these nerves, Magendie had given to the world the true theory of their uses." Magendie himself appears to have preserved a dignified silence, a silence which was, however, misinterpreted even by some of his colleagues, as shall now be shown.

On February 22, 1847, Flourens read before the Academy a "Note concerning the effects of the inhalation of ether upon the medulla oblongata."[45] At the conclusion of the paper Magendie arose. "Our honorable colleague,"[46] said he, "attributes to Sir Charles Bell the discovery of the functions of the spinal nerve roots. . . . It is not without great surprise that I hear him express himself in such a positive manner. . . . If I did not know of his good will, I might be mistaken with regard to his intentions. . . . I beg M. Flourens that when he prints his memoir he will indicate precisely the works of the English physiologist in which the discovery in question may be found described. This is not, I think, too much to require of the impartiality of our colleague."

"In stating that the discovery belongs to Bell," replied Flourens, "I merely followed the common opinion. . . . No one would be more happy than I, could I proclaim that one of the most beautiful discoveries in physiology belongs to France."

"I know," returned Magendie, "that several works on physiology couple the name of Sir Charles Bell with mine . . . but M. Flourens goes very much farther in denying me all participation in the discovery. . . . No doubt M. Flourens has not spoken without having proofs before him. . . . When he has made these known, I shall discuss them. . . . Until that time I maintain that Sir Charles Bell was a complete stranger to the discovery; I declare that my colleague is ill-informed, and his assertions not at all exact."

Flourens replied[47] that he would present his proofs at the next meeting of the Academy and added that Magendie could without doubt refute them since he, Flourens, had based his opinion largely on the attitude of Magendie himself.

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[45] Note touchant les effets de l'inhalation de l'éther sur la moelle allongée; *Compt. rend. Acad. d. Sc.*, Paris 1847, xxiv, p. 253.

[46] *Loc. cit.*, p. 258.

[47] *Loc. cit.*, p. 259.

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FRANÇOIS MAGENDIE,

Engraved by E. Schladitz after the Medallion by David d'Angers.

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Accordingly, on the following Monday, March 1, 1847, Flourens opened the discussion with these words:[48] "I beg the Academy to note carefully that I do not seek proofs against my honorable colleague, I seek only to justify my own opinion. . . . In 1833, in the *Journal des Savants,* I expressed myself thus: 'That which we call a nerve is a very complex structure; the simple structure is the nerve fibre. . . . It is only in these fibres that the properties are shown to be distinct and isolated.

" 'It is this which is really the great conception which dominates all the work of M. Bell; it is his experimental analysis, which was not confined to the nerve, but reached successively each of the primitive elements of the nerve, which is the source of all those results . . . with which he has enriched physiology. . . . But on the one hand M. Bell relied too much upon conjectures and deductions drawn from anatomical facts alone. . . . On the other hand he relied too little upon experiment; and thus it is through lack of being sufficiently eager to resort to experiment that he has allowed a French physiologist, M. Magendie, to share with him the glory of one of his most beautiful discoveries, that of the distinct function of the posterior and anterior roots.' That is what I thought, that is what I wrote in 1833. But in 1842 an event occurred which had a great influence on my opinion.

"In 1842 the Academy awarded the prize in experimental physiology to M. Longet, for four memoirs . . . one of which bore the title: 'Memoir on the functions sensory and motor of the columns of the cord and of the roots of the nerves which arise from them.' [49] In this memoir, M. Longet . . . attributed . . . the honor of the idea of the distinct function of the . . . roots . . . to M. Bell: he attributed to himself . . . the merit of the first . . . decisive experiments. Why did not M. Magendie speak?[50] . . . If he had said 'Those are my experiments,' . . . the committee would have paused. His silence was the first cause of my error.

"There is nothing more in favor of M. Bell except a single

[48] Sur la découverte de siége distinct de la sensibilité et al motricité.; xxiv, 316. *Loc. cit.,* p. 316.

[49] Mémoire s. l. fonctions sensoriales e. motrice d. cordons d. l. moelle epinière e. d. racines d. nerfs qui en émanent.

[50] The members of this commission were Magendie, Duméril, Becquerel, Flourens and de Blainville.

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fact . . . the following passage in a memoir . . . published in 1811: . . ."[51]

Magendie then spoke[52]: "The . . . facts which our honorable colleague has just cited appear to me to be exact, only he interprets them in a manner which I cannot allow. If . . .I have kept silence during the affair which has just been recalled by my colleague, no one could have interpreted it as a sort of abandoning of my claim; for the report made to the Academy . . . ran verbatim 'that I believed that I ought not to decline, as I could not be judge and party in questions in which I myself was much concerned.' I pass on now to the works of M. Bell. . . .

"It was I who first made them known in France. I analyzed them in my *Journal de Physiologie.* I have set forth their originality. . . . Charles Bell had before me, but without my knowledge, the idea of cutting separately the spinal roots; he had likewise the merit of discovering that the anterior influences muscular contraction more than the posterior. . . . With regard to the establishment of the fact that these roots have . . . distinct functions, that the anterior preside over the movements and the posterior over sensation, that discovery belongs to me . . . and ought to remain as one of the columns of the monument which the physiologists of France have raised since the beginning of the century." (*To be continued.*)

THE DEVELOPMENT OF ANIMAL PHYSIOLOGY.

(*Continued.*)

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VII.

NOTES ON SOME EARLY PERIPATETICS AND PRAXAGOREANS.

THAT Aristotle developed a system and founded a school of philosophy is familiar historical matter of fact, but it can scarcely be claimed, on a basis of sound evidence, that Praxagoras was the founder of either a definite system or a distinct school of medicine. Nor is the title of this

[51] This was the passage already quoted. Cf. footnote [42].

[52] *Compt. rend. Acad. d. Sc.,* Paris, 1847, xxiv, p. 319.

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article intended to suggest a thorough comparison of the physiologic views of these two men. For though on the one hand it is practicable, as we have seen, to gather from the extant writings of the great Stagyrite a series of statements to which, as a whole, the title Aristotelian Physiology may, in fairness, be applied, to refer to such a piece of patchwork as a system of physiology would certainly be overstepping the mark; yet, on the other hand, the little information concerning the physiologic views of Praxagoras that has filtered down to us is far from adequate, even with the aid of a fertile imagination, to form the basis of a distinctive physiologic system. Furthermore, the Peripatetics were primarily philosophers, though some of them studied and even practiced medicine; while the Praxagoreans were primarily physicians, though several of them studied philosophy. It will nevertheless become apparent, as we proceed, how marked, yet how contrary, were the influences of the respective teachings of these two men on the subsequent development of animal physiology; how the elaborate arguments of Aristotle—apparently in virtue of their logical soundness and philosophic *timbre*—seem to have satisfied rather than to have incited to further research, while the bold assertions of Praxagoras—erroneous though they were—provoked discussion and stimulated investigation.

Of the many early Peripatetics only a few, besides Theophrastus, seem to have especially busied themselves with the life-phenomena of animals, and the major portions of the writings of even those few have long since become extinct. Concerning their views the chief sources of our information are, therefore, secondary, while the information itself — or rather such of it as has survived critical sifting and re-sifting— is both diminutive in quantity and unsatisfactory in quality.

MENON, one of Aristotle's pupils, is said to have collected the writings, and endeavored to preserve in sum and substance the medical views of all Greek physicians who had lived previous to his time.* It has been claimed that the resulting *Συναγωγὴ ἰατρικὴ* was, in part at least, the work of Aristotle himself; but it is more likely that the actual work involved was done by Menon, either under Aristotle's direction or at his suggestion, and it is probable that the original collection itself, a copy, or some portion of it, was in existence in Galen's time. How valuable to present-day students of the history of

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medicine such a digest would be goes without saying. Menon was evidently a defender of the then broadly applied *pneuma* doctrine of the Hippocratists, but there seems to be no evidence that he promulgated any original physiologic views. What little we have learned of him indicates rather that he quite fully accepted those of Aristotle.

Nor is there warrant for thinking that EUDEMUS OF RHODES materially added to or in any way improved upon Aristotelian Physiology, though he wrote a number of treatises on philosophy, and, as a Peripatetic, deserves to be ranked second only to Theophrastus. Of the several men bearing the name Eudemus who figured in ancient medicine, at least two seem to have been contemporaneous—Eudemus of Rhodes and Eudemus the Anatomist, the latter of whom was a pupil of Herophilus, and his work will be reviewed later. Of the two mentioned by Galen, one was undoubtedly Eudemus the Anatomist, and the other, whom Galen designated as "the philosopher," may have been Eudemus of Rhodes, though the writer has found no passage in which he is referred to as a Rhodesian.

STRATO OF LAMPSACUS succeeded Theophrastus as chief of the Peripatetic School, and held that position for about eighteen years—from 287 until 269 B. C. Like his predecessor, he strove further to develop the philosophic system of Aristotle, the main principles of which he accepted. But he reached out farther than had either Aristotle or Theophrastus toward mechanical explanations of natural phenomena; endeavored, in fact, to refer all phenomena—psychical as well as physical—to natural causes, and refused to entertain the then prevalent notion that certain natural occurrences implied the existence of supernatural powers. In his physical philosophy he made extensive use of the action and interaction of heat and cold. He was not, however, a materialist in the Democritean sense, for he refused to accept the assumption of material atoms, maintaining, with Aristotle, that matter is infinitely divisible. Although he admitted the existence of void he supposed such void to be merely intermaterial space, and rejected as unthinkable the Democritean postulate of *infinite* void *beyond* the limits of the natural world; stoutly contending that infinite void and indivisible material particles are alike inconceivable. He was commonly known, therefore, as Strato the Physicist, an appellation which distinguished him at once from the idealists on

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the one hand and the materialists on the other, yet gave to his doctrine a status somewhat apart from that of Aristotle. Sensation and thought he interpreted as modes of soul-motion, but accentuated the necessity of proper connection between body and soul for the transmission of impressions by way of the sense-organs, and brought into prominence the dictum of Aristotle to the effect that thought implies previous sense-perception. As the bodily headquarters of the soul he indicated a region within the skull-cavity—meaning, probably, in the brain-substance—somewhere in the neighborhood of the nasion; and it is quite likely that he supposed the *pneuma* to intermediate between soul and body.

Clearchus of Soloi and Callisthenes of Olynthus each wrote a treatise on anatomy, and Phanias seems to have been especially interested in natural science as then understood, but there is no evidence at hand indicating that any of these three early Peripatetics made noteworthy contribution to physiology.

PLISTONICUS, who flourished during the last quarter of the fourth century B. C., was one of the most prominent of the immediate disciples of Praxagoras. Galen assures us that he was an able anatomist, and mentions him in company with Diocles, Praxagoras, Mnesitheus, Philotimus, Herophilus and Erasistratus.[1] He is also referred to by Celsus, Pliny and Oribasius. The concept that digestion is a sort of cooking process, which was taught by the Hippocratists and endorsed by Diocles, Plato and Aristotle, was opposed by Plistonicus, who contended that digestion is rather of the nature of putrescence. For this bit of information we are indebted to Celsus, who,[2] however, merely states it as an historical matter of fact, giving no description of the process as understood by either Plistonicus or himself, nor clue to the evidence, if any, offered in support of the contention. That, under the influence of moisture and summer-heat, dead flesh undergoes decomposition, accompanied by the development of disagreeable odors, was as generally known then as it is now, and it is quite likely that Plistonicus supposed food to undergo similar changes in the cavity of the stomach; but that he definitely distinguished between putrefaction, properly so-called, and other forms of decay or corruption is extremely improbable. As a physician he undoubtedly had abundant oppor-

[1] Galen. De Hipp. et. Plat. Dec. *Lib. viii, cap. 5.*
[2] Celsus. De Medicina. *Lib. i, Pref.*

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tunity to familiarize himself with the gross appearance, odor and other sense-qualities of vomited gastric-contents in various stages of digestion, and it may be that the knowledge thus obtained suggested to him the idea that food normally putrefies in the stomach.

PHILOTIMUS, another disciple of Praxagoras, who flourished during the early part of the third century B. C., wrote several works of physiologic interest, among which was a treatise on nutrition and another on body liquids. In the works of Galen he is referred to a number of times as among the ablest of ancient physicians and anatomists, but very little definite information concerning his physiologic views is given, though it is plainly asserted that he, among others, supposed the brain to be a physiologically useless organ.[8]

Xenophon of Cos, Mnesithius and Dieuches of Athens, and Menocritus were also probably pupils of Praxagoras, but, though eminent as physicians and interested, no doubt, in physiologic problems, the records thus far examined give no credit for original work in physiology to any of them.

But the most famous of all the pupils of Praxagoras was Herophilus, one of the two great teachers of medicine at Alexandria, whose work will be dealt with in a separate article.

(*To be continued.*)

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A SKETCH OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE.

By Fielding H. Garrison, M.D.,
Assistant Librarian, Surgeon-General's Office, Washington, D. C.

THE Library of the Surgeon-General's Office is situated in the Army Medical Museum, corner of Seventh and B Streets, S. W., Washington, D. C. This building also contains a medical supply depot of the army, the rooms and offices of the Army Medical School, and the Army Medical Museum proper, which is one of the most complete and interesting collections of its kind.

The Library consists of a large central hall in the west end of the building, which contains the book-stacks, an adjoining reading-room and a series of office rooms, in which the administrative and bibliographical work of the Library is performed.

The Library contains at present 158,791 volumes and 279,698 pamphlets, making in all, 438,489 volumes and pamphlets, and is now considered one of the largest three medical libraries in the world, equalled only by the collections of Paris and St. Petersburg in the number and value of its treasures. The reading-room of the Library is open to the public from 9 A. M. until 4.30 P. M., but medical books are lent to physicians on payment of a suitable deposit. In the case of physicians residing in distant cities and educational centers, volumes are frequently forwarded through universities, public libraries and medical societies, which in this case assume responsibility for the books lent and for their safe return. A detailed description of the classification and arrangement of books in the Library will be found in the *Bulletin of the Association of Medical Librarians,* Baltimore, 1902, i, pp. 70 *et seq.*

The Library is constantly used by physicians from all parts of the country, many of whom frequently make an extended visit to Washington in order to avail themselves of the unique advantages offered for research in the different branches of medical literature. There have even been instances of visits from physicians abroad, who have crossed the ocean in order to consult certain works in this Library which were not available elsewhere. In this connection it is proper to say that the Library has the most unrivalled collection of medical periodicals in the world, is singularly rich in incunabula and the works of earlier

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medical writers, and, through its agents in London, Paris, Leipsic, Turin, Amsterdam and St. Petersburg, is constantly supplied with all modern medical literature as soon as published. Practically all the available purchase fund is spent on modern medical books and periodicals, for the reason that careful scanning of booksellers' catalogues shows that the collection of old authors, first editions, etc., is now well-nigh complete of its kind.

As an example of the richness of the Library in old medical authors we may instance its collection of the works of Hippocrates, the "father of medicine." In this Library there are at least fifty-one different editions of his "opera omnia" or collected works, in Greek, Latin, Italian, Spanish, French, English and German, including the first printed edition of his complete works in the original Greek, a beautiful specimen of early typography issued by the Aldine Press at Venice in 1526; of separate treatises there are 433 editions, and of general commentaries upon the works and doctrines of Hippocrates, including bibliographical and biographical works, there are 398 separate treatises. The total number of works of Hippocrates with commentaries in the Library is, therefore, 882.

The Library of the Surgeon-General's Office is thus the Nation Medical Library by reason of its extent and value and its situation in the capital city, and the credit of building up and maintaining this remarkable collection is due to Dr. John S. Billings, now the distinguished Director of the New York Public Library. The following facts in connection with its history may be of interest: "For many years there was a small collection of medical books and journals in the Surgeon-General's Office at Washington, which collection was commenced by Surgeon-General Lovell prior to 1836. At the commencement of the Civil War this collection amounted to between three and four hundred volumes." During the administration of Surgeon-General Hammond, 1862-3, 359 volumes were added to the collection. During 1864-5 about 1,000 were added, selected mainly by Drs. Woodward and Otis. In the fall of 1865 the Library came under the administration of Dr. John S. Billings, who had just completed a long and honorable period of service as Army Surgeon during the Civil War. Dr. Billings at once recognized the opportunity offered of founding a great national medical library, and the valuable collection we have to-day is the result of his energy, perseverance and judgment. Aided by liberal appropriations

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from Congress, the growth of the Library under its able and energetic director was phenomenal.

A catalogue of the books in the Army Medical Library was published in 1872 and another, in three volumes, in 1873-4. In connection with this, Dr. Billings had early conceived the idea of indexing the files of periodicals in the Library, so that as an addition to the catalogue of authors a subject index of the literature of medicine might also be printed. The work of indexing periodicals was actually begun in 1873, and in 1876 a "Specimen Fasciculus of a Catalogue" of the Library, consisting of a combined index of authors and subjects, arranged in dictionary order in a single alphabet, was printed and distributed to medical libraries and bibliographers to obtain criticisms and suggestions as to the form of catalogue that would be most acceptable and useful. At this time the Library contained about 52,000 books and pamphlets.

Soon after the publication of the "Specimen Fasciculus" Dr. Robert Fletcher was assigned to duty in the Library and became the principal assistant in the work of preparing and printing the *Index Catalogue.* The first volume of the latter, a large quarto of 888 pages, was printed in 1880, and fifteen volumes of similar size followed, making a first series, from A to Z, of sixteen volumes, 1880-1895. Volume I of the second series was printed in 1896, and eleven volumes of this series, 1896-1906, have been printed to date, covering the alphabet from A to N, inclusive. After the completion of Volume XVI of the first series, Dr. Billings was retired from the Army at his own request, to assume the Professorship of Hygiene in the University of Pennsylvania, and the redaction of the *Index Catalogue* to date has been under the care of Dr. Robert Fletcher. In the words of Dr. Billings: "The accuracy and typographical excellence of the volumes are largely due to his careful and skillful supervision." The administrative successors of Dr. Billings in the Library have been Colonel D. L. Huntington, 1896-7; Major James C. Merrill, 1898-1902; Major Walter Reed, 1902. The Library is at present under the able administration of Major Walter D. McCaw.

In connection with the *Index Catalogue,* Dr. Billings and Dr. Fletcher conceived the idea of printing the *Index Medicus,* which is a monthly bibliography of the medical literature of the world. The "annual index" of the *Index Medicus,* printed

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at the end of each volume, is a miniature *Index Catalogue* of the medical literature of the given year which it covers. Volumes I to XXI of this work, which is of inestimable value to the scientific and literary members of the medical profession, were printed during the years 1879-1899, but the publication was discontinued during the latter year owing to lack of financial support on the part of the physicians. At the request or instance of leading members of the medical profession, the *Index Medicus* was revived in 1903 under the patronage of the Carnegie Institution. Three volumes of the second series have been printed, 1903-1905, and a fourth volume is now in preparation.

The *Index Catalogue of the Library of the Surgeon-General's Office* consists, as its title implies, of a full catalogue of the works contained in the Library, and in proper alphabetical sequence, a complete bibliography by subjects of the literature of medicine, carefully indexed, classified, subdivided and arranged under the subject headings in alphabetical order by authors. Although bibliographies of medical literature had been attempted before, by Gesner as early as 1545, and later by Merklin, von Haller, Ploucquet, Haeser, Young, Forbes, Atkinson, Callisen, Watts, and others, yet, in the language of Osler, "Their efforts are Liliputian beside the Gargantuan undertaking of the Surgeon-General's Office," which he describes further as "One of the most stupendous bibliographical works ever undertaken." By reason of the completeness of its bibliographies (especially in the matter of periodical literature), and its exhaustive cross-references, the *Catalogue* is practically a working guide and index to the medical libraries of other cities and countries, and it is stated on good authority that well-thumbed and well-worn copies in foreign universities and libraries attest its constant use.

A word as to the method pursued in carding and indexing books and periodicals for the *Catalogue* may be of interest. When a book is received in the Library, it is first properly stamped, numbered and entered in a register giving the number, date of accession and description of the volume. A ticket is pasted inside the book giving the accession number, proper location of book in the Library (indicated by a special formula giving number of story, alcove, partition and shelf), and the

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name of the donor (if any). Two cards are then written, as follows:

1. An author-card, giving author's full name, title-page in full, pagination, size, place of publication, publisher and date (of publication). On the back of this card is written in pencil the date of accession of the volume, whether it is bound or unbound, and (if it is a pamphlet) the number of the box in which it is stored or of the volume of miscellanies in which it is bound up. The author-card is thus the final authority as to the location of any given book in the Library. These cards, together with the cross-reference author-cards (*i.e.*, joint authors, editors, etc.) are arranged in strictly alphabetical order, constituting the author-catalogue of the Library.

2. A subject-card, giving author's name with initials only, title in full, size, place and date of publication. Where possible, the above data as to location of the book in the Library are given also. In the case of articles indexed in periodicals, only a subject-card is written. Over the top of each of these subject-cards is finally pencilled its proper place in the bibliographical scheme of classification, *e.g.*, Diphtheria (*Preventive Inoculation against*), Liver (*Cirrhosis of, Treatment of, Operative*), Paralysis (*General*) *in relation to syphilis, etc.* In each case an attempt is made to find the true center of gravity of a given title, so that the card may be placed under the bibliographical heading to which it actually relates. References which may be of especial value for statistics or other special lines of investigation, *e.g.*, special complications of cases, operative treatment, etc., are carefully separated. The cards are then classified in alphabetical order of subjects as indicated *in extenso* in the *Index Catalogue.*

The edition of the *Index Catalogue* is limited to 1,500 copies, which are distributed with care and discrimination among the great medical and general libraries of the United States and Europe and among individual workers in scientific medicine. The cordial recognition and appreciation of the work of the *Catalogue* by medical men is evidenced by their constant use of the Library, by the great increase in the number of large medical libraries in the country, many of which, like those of Boston, Philadelphia and Baltimore, have adopted the methods of the National Medical Library, and by the many honors shown to the editors of the *Catalogue* by the medical profession.

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Tokens such as these go far towards verifying the prediction made by Dr. Billings, thirty years ago, that "If a sufficient number of the *Catalogue* be printed and distributed to our medical writers and teachers, so that they may at their leisure learn what aid they can obtain in their researches, no collection of the Government will be more used or be of more practical utility; that it will soon tend to elevate the standard of medical education, literature and scholarship of the nation and will thus indirectly be for the benefit of the whole country, since the general knowledge and skill of the medical profession become a matter of personal interest to almost every individual at some time during the course of his life." It will be seen, therefore, that the gratitude of the entire medical profession, if not of the public, is due to the liberal and broadminded spirit displayed by Congress in furthering and supporting this important work, which is one of the well-recognized landmarks in the history of modern medicine, and (if we may again cite Osler) "will ever remain a monument to the Army Medical Department, to the enterprise, energy and care of Dr. Billings, and to the scholarship of his associate, Dr. Fletcher."

"Two courses are open to the historian of medical science. Either he may trace the progress of medical theory . . . or he may record the successive facts which have been from time to time contributed, to form an inductive foundation for an exact science.

"We cannot afford to dispense with either, both being necessary to the student who aspires to a comprehensive knowledge of the present condition of medicine; for although the one may be little more than a relation of amusing fallacies, and the other an uninteresting epitome of unconnected facts, yet the two are inextricably bound together, and so much so are they that the very nomenclature of the one has been derived from the prevailing fashion of the other. The two being thus combined, naturally lead to the threefold question relative to medicine; namely, what it has been, what it is, and what it may become hereafter."—*Meryon.*

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TRANSACTIONS OF THE JOHNS HOPKINS HOSPITAL HISTORICAL CLUB.

The programs of meetings have been as follows:

OCTOBER 16, 1905.

1. "John Howard's Observations on Hospitals, 1773-1790." By DR. HENRY M. HURD.

2. "The History of Typhoid Fever." By DR. THOS. MCCRAE.

3. "Famous Artists as Anatomists." By DR. THOMAS B. FUTCHER.

NOVEMBER 13, 1905.

1. "Malpighi as a Physician." By DR. WM. G. MACCALLUM.

2. "Florence Nightingale and Her Books." By DR. HENRY M. HURD.

3. Exhibition of Books, etc.

DECEMBER 11, 1905.

1. "The Life and Work of Carl Weigert, with Personal Reminiscences." By DR. WM. H. WELCH.

2. "Moses Maimonides—In Memoriam (1205-1905 C. E.)." By MR. D. MACHT.

3. "A Letter of John Hunter's." By DR. HARVEY W. CUSHING.

JANUARY 29, 1906.

The Symposium of the Gold-Headed Cane.

1. "History of the Gold-Headed Cane." By DR. THOS. MCCRAE.

Dr. McCrae outlined the history of the cane from its appearance in medical circles, probably about the year 1689, and its passage through the hands of its various owners, Radcliffe, Mead, Askew, the two Pitcairns, and Baillie. It now reposes in the College of Physicians in London.

2. "John Radcliffe." By DR. WM. OSLER.

Enlivened by anecdotes, Dr. Osler's sketch of the first owner of the cane brought out many interesting points in the life of this most striking character. Dr. Osler concluded his remarks by stating: "So there are at least four special foundations connected with his name, all are associated with scientific work, and certainly there is no modern physician with so many large and important monuments. Yet he put no line to paper, but saved with a special object in view. One lesson learned from his life is that if you do not write, make money, and, after you finish, leave it to the Johns Hopkins Trust."

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3. "Matthew Baillie." By DR. THOS. FUTCHER.

After narrating the principal events of Dr. Baillie's life and his most important contributions to medical literature, Dr. Futcher concluded: "Of the various possessors of the Gold-Headed Cane, Baillie contributed more towards the advancement of the science of medicine than any of the others. His "Morbid Anatomy" was in many ways an epoch-making work and was a model of conciseness and of accuracy in observation."

4. "The Holders of the Gold-Headed Cane as Book Collectors." By DR. HARVEY W. CUSHING.

John Radcliffe is said to have boasted that a few vials, a skeleton and a herbal constituted his library; and yet in two ways he showed the respect that he actually held for the learning to which he himself was a stranger. Of the founder of the Radcliffe Library one of his contemporaries remarked that it would be as appropriate for an eunuch to found a seraglio as for Radcliffe to establish a library. Richard Mead, on the contrary, was a noted collector; in fact, there is hardly a more lustrous name in bibliophilic annals. His collections, not alone of books, gave him a world-wide reputation that outshone even the repute of his professional attainments. On his death the sale of his library extended over twenty-eight days. In his history of the disease "Bibliomania," Dibdin says that Mead died of the complaint, and adds: "It is almost impossible to dwell on the memory of this Great Man without emotions of delight—whether we consider him as an eminent physician, a friend to literature, or a collector of books, pictures and coins."

Though Anthony Askew never attained to the position in the community held by Mead as a patron of the fine arts in general, his library became perhaps even more widely renowned than that of his predecessor. After Askew's death his collection of books was dispersed at auction, and the sale of this library has been considered a sort of *aera* in bibliography.

With Askew ended Bibliomania, so far as it concerned the peripatetic life of the Gold-Headed Cane.

TRANSACTIONS OF THE ST. LOUIS MEDICAL HISTORY CLUB.

REGULAR MEETING, JUNE 28, 1906.

A regular meeting was held in the St. Louis Medical Library on Thursday, June 28th. There were present Drs. F. J. Lutz, H. N. Spencer, M. G. Seelig, A. J. Steele, Joseph Grindon, K. W. Millican, Otto Wall, M. B. Clopton, N. Allison, H. M. Whelpley, J. Moores Ball, G. M. Tuttle, W. A. Hardaway, and Heinrich. Dr. K. W. Millican was voted to the Chair.

The following new members were elected: Dr. L. M. Warfield and Dr. R. Eccleshymer.

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A committee was appointed by the Chairman, on motion of the Society, to consider the organization of a systematic collection of the history of Missouri "Medicine in the making." The committee consisted of Dr. H. M. Whelpley, Dr. N. Allison, and Dr. J. Moores Ball.

Dr. Grindon presented for inspection a copy of the "Opera Omnia Anatomica et Physiologica" of Hieronymus Fabricius ab Aquapendente, with preface by Bohnius, in folio, Leipsic, 1687. This edition, published by Gleditschius, is the first in which Fabricius's complete anatomical and physiological works "hitherto published in various places and forms" were brought together in one volume. The surgical writings are not here included. The volume contains fifty-nine full-page copper plates, many of them of marked excellence. The chief points of interest contained are the articles on the comparative anatomy of gestation, profusely illustrated and witnessing to an enormous mass of investigation; and the article on the valves in the veins. Fabricius claimed he was the first to see these structures, a claim to-day discredited, at least in part. It remains true that he was the first to give an exact and detailed description (supplemented by seven plates) and thus to popularize the knowledge of their existence.

Incidentally, and to verify a reference, Dr. Grindon also showed a copy of the "Tabulæ Anatomicæ" of Eustachius, republished at Rome in 1728, in folio, from the original plates, with text by Lancisi, under the patronage of Pope Clement XI, whose medallion, surrounded by allegorical figures superbly executed, appears as a frontispiece.

Dr. A. J. Steele exhibited the original illustrated brochure of Percival Pott on the "Spine," and read a brief but well selected account of Pott's career.

Dr. Otto Wall gave a talk on the evolution of the mortar, illustrating his remarks by drawings illustrative of the various contrivances for grinding substances from the earliest times, and pointing out how the various principles involved inhere in all modern mills. He showed two specimens, an Egyptian symbolical mortar of brass, ornamented with passages from the Koran, and a wooden mortar obtained from natives of the interior of Africa, accompanied by an iron pestle undoubtedly obtained by the natives from some outside source. The pestle suggested an ancient weapon of the character of a mace.

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OFFICIAL ORGAN OF THE ASSOCIATION OF MEDICAL LIBRARIANS

EDITED BY

ALBERT TRACY HUNTINGTON

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Vol. 4 June, 1906 No. 2

EDITORIAL.

CONCERNING AN AMERICAN HISTORY OF MEDICINE.

WHEN one glances over the shelves of the modern medical library one is impressed with the enormous mass of medical literature which emanated from the pens of American and British authors. It would seem at first sight that every minute topic in medical literature had received more than adequate attention at the hands of English writers. Yet, a closer inspection will disclose one subject at least, which stands out in striking contrast—we refer to medical history. What does one find in the English language on this subject? Antiquated "histories," interesting—and inaccurate, a few very creditable epitomes and narrative sketches of recent date, and a very limited number of special monographs representing the most thorough research and ripest scholarship, of which we may well be proud. For a complete history one must turn to

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the French and German writers, where one finds much chaff of verbiage and some wheat.

We believe there is a field for a complete history of medicine written in the English language. An adequate presentation of the subject would necessitate a work in several volumes and we doubt if any one man, single-handed, could carry through a task of so great magnitude, involving so much research. We believe that the best method, in undertakings of this nature, is the careful selection of writers, each an unchallenged authority in his special chosen field, and then the judicious editorial welding of the material presented.

It has been suggested from many sources that the publishing of such an history be undertaken by the JOURNAL. We do not believe that the time is quite ripe. We have a constantly increasing number of historical students diligently browsing in an attractive pasture, but the number of scholars is limited. A further process of ripening and of the tilling of special chosen fields is essential. As a means to this end it would be desirable that the workers along these lines should come into closer affiliation. The organization of an American Medico-Historical Society would seem to be the first step in order to bring about this closer knowledge of each other's work.

BOOK REVIEWS.

THE WORLD'S ANATOMISTS. Concise Biographies of Anatomic Masters, from 300 B. C. to the Present Time, Whose Names Have Adorned the Literature of the Medical Profession. By G. W. H. Kemper, M.D. *Phila., P. Blakiston's Son & Co., 1905.* Paper, 25 cents.

This little volume contains biographical sketches, condensed into a few lines each, of the world's anatomists. Reprinted for the most part from the defunct *Medical Book News,* a few new sketches have been added and a number of new illustrations have been incorporated. A handy little guide for quick reference to names and dates.

OLIVER WENDELL HOLMES AND THE CONTAGIOUSNESS OF PUERPERAL FEVER. An Address. By Charles J. Cullingworth, M.D., F.R.C.P. *Lond., H. J. Glaisher, 1906.* Port., front., 4 l., 41 pp. 8vo. Price: Cloth, 2s. 6d.

The American profession is under obligations to the author

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for this admirable address in which, at the outset, he announces his purpose "to call attention afresh to Holmes' memorable essay, and to try to do something towards removing the reproach, not, I fear, entirely undeserved, that we English-speaking people on both sides the Atlantic, whilst giving abundant honor to Semmelweis, have been in danger of forgetting the earlier and equally remarkable contribution to our knowledge of puerperal fever that we owe to one of our own kith and kin."

Dr. Cullingworth performs his self-appointed task in an irreproachable manner and the little book is one that many American physicians will desire to possess.

The portrait of Holmes, which serves as a frontispiece, is from a daguerreotype taken between 1845 and 1850.

"The profession of medicine must ever occupy a conspicuous position in the scientific history of a nation. Independently of its being devoted to purposes of high utility and exalted benevolence, the necessary alliance which there exists between medicine and the other departments of science will always confer upon it a peculiar pre-eminence over every other professional pursuit. So intimate, indeed, has been this alliance that we shall find on the one hand medicine receiving laws in succession from philosophy, mathematics and chemistry; and on the other hand, the members of the medical profession will be recognized to have been, in every age and country, among the most successful cultivators of general science."—*John B. Beck.*

"A review of the past . . . [is] . . . in the highest degree profitable. Indeed, without such a review, and a careful tracing of present evils and defects to their origin and remote causes, no member of the profession can be prepared to act wisely his part in the great progressive movements of the age; or can discharge, with fidelity, the duties devolving upon him, as a member of a learned and honorable profession."—*N. S. Davis.*

"There is probably no more difficult mental task than that of tracing accurately the chain of causation in the progress of any class of human society. Yet on this depends the whole value of history. Without it, instead of being 'philosophy teaching by example,' it becomes a mere record of isolated facts, quite as susceptible of a wrong as a right application."—*N. S. Davis.*

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NOTES AND NEWS.

The Report of the Bristol Medical Library (Eng.) for the year 1905 shows that 514 volumes were added during the year. By the combination of the libraries of the Bristol Medico-Chirurgical Society and the Medical Department of University College, Bristol, practitioners and students can consult 21,383 volumes and 226 current periodicals.

The seventh annual report of the St. Louis Medical Library shows that during the fiscal year 3,315 volumes were added, making the total number of volumes 8,647. An important addition will soon be made, the St. Louis Mercantile Library having agreed to transfer all its medical books, numbering 1,700, to the Medical Library. Considering the rapid growth of the library it seems necessary to add another room for the shelving of books. The library is in prosperous condition and its usefulness is rapidly increasing. At present 137 medical journals are received, of which 42 are foreign. Dr. F. J. Lutz is Librarian.

In Chicago, Ill., arrangements have been completed for the transfer of the Medical Department of the Newberry Library to the ownership and management of the John Crerar Library.

The annual meeting of the Cleveland Medical Library Association was held at the Library on January 15th. The following officers were elected for the ensuing year: President, Dr. Dudley P. Allen; Vice-President, Dr. D. H. Beckwith; Secretary, Dr. H. L. Sanford; Treasurer, Dr. H. G. Sherman; Librarian, Dr. C. A. Hamann.

The report of the Treasurer showed that enough money had been secured from private and professional sources to enable an early carrying out of the plans for the new building, and that money pledged in the profession had warranted alterations in the old building to provide reading and gathering rooms for the use of members.

The President explained in detail from plans the features of the new building, which is to be erected at the rear of the present building: The first floor will be taken up by a modern

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stackroom, which will have a capacity of 50,000 volumes and space for the librarian. The upper floor will be a large auditorium which will seat 300, and which will be used for meetings of the Academy of Medicine, and such other medical and scientific societies as may seem appropriate.

NEW JOURNALS.

Arbeiten aus dem hirnanatomischen Institut in Zürich. Hrsg. von C. v. Monakow, Wiesbaden, J. F. Bergmann, 1905. Hft. 1. Mk. 8.

Arbeiten aus dem königlichen Institut für experimentelle Therapie zu Frankfurt a. m. Hrsg. von P. Ehrlich. Jena. G. Fischer, 1906. Heft 1. Mk. 7.50.

Encéphale (L'). Journal de psychiatry. Pub. et dirigé par A Antheaume, [et al.], Vol.I, No. 1, Jan.-Fév., 1906. Paris, H. Delarne et cie. Yearly, 23 frs.

Hygienisches Zentralblatt. Hrsg. von P. Sommerfield. Vol. I, 1906. Leipzig, Borntraeger. Yearly, Mk. 30.

Internacia Revuo Medicina. Monata organo en Esperanto, Deutsch, English, Español, Français, Italiano, etc. Vol. I, No. 1, Jan., 1906. Paris, 33 Rue Lacépède. Yearly, 12 frs.

Klinik für psychische und nervöse Krankheiten. Hrsg. von R. Sommer. Vol. I, No. 1 [Apr.], 1906. Halle a. S., C., Marhold.

Mitteilungen aus dem Laboratorium für radiologische Diagnoslik und Therapie im k. k. allgemeinen Krankenhaus in Wien. Hrsg. von G. Holzknecht. Jena, G. Fischer, 1906. Heft. 1. Mk. 3.

Zeitschrift für Intektionskrankheiten parasitäre Krankheiten und Hygiene der Haustiere. Hrsg. von R. Ostertag, E. Joest und K. Wolffhügel. Vol. I, No. 1, Nov., 1905. Berlin, R. Schoetz, 1905.

"A wise physician, skilled our wounds to heal,
Is more than armies to the public weal."

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MEDICAL LIBRARY AND HISTORICAL JOURNAL

Vol. 4 September, 1906 No. 3

THE HOTEL-DIEU OF PARIS—AN HISTORICAL SKETCH.

By Ellen N. La Motte.
Baltimore, Md.

THE Hôtel-Dieu of Paris possesses the distinction of being the oldest hospital in the world, there being no similar institution which can show an uninterrupted record of over twelve centuries spent in caring for the sick poor. It is this fact of its antiquity which gives to the Hôtel-Dieu a peculiar interest for us at the present day, and which furnishes the motive for the following paper, in which an endeavor has been made to present some of the most interesting and important facts concerning the origin and subsequent history of the hospital. The materials for the paper were collected from books based on such of the original documents relating to the Hôtel-Dieu as have survived. These books were compiled at various times and deal with various aspects and phases of the institution. Though they do not in themselves constitute an adequate history of the Hôtel-Dieu, they are useful in rendering accessible much valuable information which would otherwise be difficult to obtain, owing to the jealousy with which the archives of the hospital are guarded.

Without doubt the Hôtel-Dieu owes its remote origin to the decree passed by the Councils during the first centuries of the Church in Paris, whereby it was ordained that the Church should receive and shelter all who stood in need of succor. Accordingly the palaces of the early bishops became houses of refuge open to unfortunates of every description—those who were diseased, homeless, poverty-stricken or otherwise afflicted. No distinctions were made as to social standing, nationality or religion; the only condition necessary for admission was that the applicant show "the signs of poverty or of misery," upon which

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he was received and welcomed, and the order given to treat him "like the master of the house." To all who thus asked it the Church extended freely a simple and noble hospitality.

The institution of this custom on the part of the Church was the initial stage in the evolution of the hospital. The succeeding stage is marked by what may be looked upon as the actual foundation of the hospital, though, in this connection it should be borne in mind that the authenticity of the accounts from which these statements are derived is not undisputed. In the year 651, the treasures of the Church were sold by Landri, Bishop of Paris, for the support of the large numbers of poor people who in that year sought in his palace an asylum from the miseries caused by a famine then prevailing. From this recognition of the claims of these people and the necessity of thus supporting them, the definite foundation of the Hôtel-Dieu is generally dated. Moreover, Landri made provision for their spiritual and physical care by creating the order of Augustinian Nuns, who throughout the existence of the Hôtel-Dieu have been in charge of its inmates. Nine years later an important step was taken by the setting apart of a special building for the use of those who came to the Church to be sheltered and cared for. The building appropriated for this purpose had been a monastery inhabited by the nuns in charge of the treasures and linen belonging to the Cathedral of Notre Dame, and in its new capacity became known as the Hospital of St. Christopher, from its connection with the chapel of that name. Both monastery and chapel, together with his own palace, had been presented to the Church by Archambaud, Count of Paris, as a contribution toward a hospital for the sick poor. In 829 the converted monastery was torn down, and on its site a new building was erected, this being the Hôtel-Dieu properly so called. The record or deed for permission to erect this building is still preserved, and is the oldest existing specimen of a deed given for the erection of a hospital.

The original buildings of the Hôtel-Dieu consisted of four halls or wards intended to accommodate eight or nine hundred patients, though at times this number was enormously exceeded. The wards were named and used as follows: that of St. Denis, in which were placed extremely ill patients; the Infirmerie, for those "in whom the principle of life was not entirely extinct;" the ward of St. Thomas, for convalescents of every sort; and the New Ward, for women. The basement of the latter was

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used as a maternity ward; it fronted directly on the river, and was thereby rendered not only extremely damp, but also liable to flooding at periods of high water when the river might rise above the level of the windows. In spite of this unsanitary and at times dangerous situation, removal of the patients was never permitted, as their condition was considered "an offense to the eye."

From 830 to the beginning of the 14th century the Hôtel-Dieu increased greatly in size, additions being continually made to the buildings in order to accommodate the enormous numbers of people, including the sick, the aged, children, paupers and mendicants, who pressed for admission; so that by 1219 the number of wards had increased to 25, and the average number of inmates varied from 1400 to 1600, though this was greatly exceeded in seasons of plague and epidemics. For this condition of affairs the disturbed state of the times was largely responsible. Civil and foreign wars reduced the peasants to such conditions of poverty and distress that they flocked to Paris in multitudes to obtain relief, and when within the city naturally sought the Hôtel-Dieu as their place of refuge. Bands of wandering soldiers imported and spread broadcast diseases and pestilences from all countries, thereby greatly increasing the numbers of the sick who sought the hospital for care and treatment. Many inmates were also contributed from the hordes of mendicants that were one of the characteristic scourges of the Middle Ages. When one considers that the Hôtel-Dieu represented at that time not only a combination of all the hospital institutions in use at the present day, but was also an almshouse and a free lodging house, one cannot wonder that under the circumstances above indicated its capacity became utterly inadequate to the demands made upon it, in spite of all efforts to keep up with them, and that frightful overcrowding resulted.

From the sources mentioned we are fortunately able to obtain many graphic details in regard to conditions existing in the great hospital in the Middle Ages. The state of the wards was most unsanitary. There was no ventilation, even the stairways serving only to carry the impure air from one floor to another. The windows were small and placed near the ceiling, and in many of the wards were on one side only. The dampness already existing owing to the proximity of the river was increased by the custom of drying the linen on racks extended along the sides of the wards. No method of heating the building was used

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except that indicated by one writer, who says that this "was accomplished by the patients themselves;" and we can well imagine how, in default of other means of producing warmth, the escape of animal heat would be jealously guarded against. Cleansing processes were represented chiefly by abundant sweeping, judging from the recorded annual supply of 1300 brooms; and by an annual whitewashing at Easter.

The beds in each ward were placed head to foot, usually in four rows extending the length of the hall. In times of epidemic they were placed close together, by which means their already overtaxed capacity could be further increased, though this method of placing made it extremely difficult for the nuns to move about in performing their duties. In this connection it should be recalled that during the Middle Ages single beds were unknown. Travellers stopping at inns might be called upon to sleep three or four in a bed if the condition of the inn required it, and considering the Hôtel-Dieu in its character of an enormous inn it was but natural that its inmates should be treated as in other inns—the fact of their illness being an accident of minor consideration. Accordingly the beds were of large size, of the "four poster" variety, provided with curtains of red serge in winter and of white linen in summer. Each was supplied with one or two feather pillows and a straw mattress, which rested on cords stretched from side to side of the bedstead. The mattress was made over three times a year and the cords renewed as often as necessary. To each bed were allowed two or three sheets and a large quilt. The supply of bed-linen was plentiful—a thousand sheets in use in wards and a thousand in reserve constituting the weekly amount. The charge of the linen belonged to the Prioress, who personally supervised its use and distribution and bought the annual supply. This part of her function was regarded with such esteem that she was often designated as holding the "Office of the Linen." The quilts used were made of gray cloth lined with fur of mixed varieties, from dogs, cats, sheep, foxes, squirrels, etc., several kinds being used in one quilt. Once a year, in July, these quilts were cleaned and remade. Aside from the quilts, for which regular furriers were required, the work of renovating the bedding was done by the nuns and novices and as many of the convalescent patients as could be pressed into service, and the completion of the labor was always celebrated by a banquet, which included all the luxuries of the season.

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Patients were admitted to the hospital at any hour of the day or night, merely upon application at the door, where a nun was constantly on duty to receive them. When admitted the patient was first of all required to confess himself, and was then put to bed with no other clothing than a nightcap, as was the fashion of the times. His clothes were taken to be washed and carefully mended, in readiness for their return on his discharge. Every few weeks a sale was held of the clothes of those patients who had died. No attempt whatever was made to diagnose the disease of the newcomer, and he was placed in one ward or another, not at all according to the nature of his ailment, but according to the degree of his illness; nor was this lack of segregation confined to the placing of patients in wards, as four, six, ten or more might be placed in one bed with a total disregard of the nature of the disease from which each individual was suffering—thus, one might find a man dying of smallpox side by side with one dying of accidental injury, so placed with no further thought on the part of the hospital attendants than that each stood in urgent need of the spiritual offices of the Church. Insane patients, of whom there was always a large number in the hospital, were placed with the rest, the only treatment given consisting in tying them down to their beds and feeding them.

Until 1535, when Francis I founded the Hôspital des Enfants Rouges to receive them, there were usually between sixty and a hundred children in the Hôtel-Dieu, the majority of whom had been in perfectly sound health when admitted, coming in with sick mothers who had no means of providing for them otherwise. The condition of these little ones was, if possible, worse than that of the other patients. As no special ward was provided for them, they were distributed at random, sick or well, wherever there happened to be room for them, often to the infinite discomfort of the adult patients as well as to their own great danger. It was no unusual thing for as many as a dozen children to share the bed of a syphilitic, an insane patient, or a dying man. For the nourishment of very young children there was a wet nurse, never more than one, however large the number requiring to be thus provided for. Sometimes a patient in the maternity ward who had lost a child would be induced to nurse a few of these children, but, as a writer of that period puts it, the milk of these sick women, "corrupted by ennui,

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sadness and melancholy, was not nourishing for the other children and often caused illness among them."

Every patient on being pronounced cured of his original malady was obliged to remain for a week longer as a convalescent. During that week he frequently contracted some new disease within the hospital itself, and possibly fell a victim to a series of diseases before he was able to leave—if indeed he survived at all, for this enforced week of convalescence tended greatly to increase the mortality, already enormous from other causes, as may be surmised.

The food provided for the patients was without doubt of poor quality and insufficient in quantity. Two meals a day were given, at eleven in the morning and at six in the evening. The sickest patients were provided with a better quality of food and wine than that given to the others. All alike were forced to observe three fast days a week, to say nothing of Lent, observances by which their supply of nourishment was deplorably decreased.

As already shown, the practice of isolating contagious diseases or of placing any restriction on their admission to the hospital was almost unknown. Victims of leprosy, however, had from the earliest times been refused entrance to the Hôtel-Dieu, some 2,000 leper houses being provided for their reception in different parts of France. In the case of syphilis also, when in 1495 that disease made its first recorded appearance in Paris, the authorities of the Hôtel-Dieu became so alarmed by the rapidity of its spread within the hospital that they caused special houses to be set apart for the segregation of syphilitic patients* and for a while they made every effort to exclude such cases from the hospital itself. The construction of a special hospital for syphilis was discussed, but after a year or so the alarm at first created by the appearance of the disease died down, and both the projected hospital and the houses of isolation were abandoned. For thirty years longer syphilis prevailed in the hospital to an enormous extent.

Down to 1905 the entire administration of the Hôtel-Dieu was in the hands of ecclesiastics. At the head were the Canons forming the Chapter of Nôtre Dame, who were responsible for

*One of these houses was at first located near the dwelling inhabited by the Canons of Nôtre Dame, but its vicinity caused such a panic among the latter that it was shortly removed.

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all laws and regulations governing the hospital, and for all disbursements made in its behalf. The personnel of the hospital was made up as follows: The Master, under whom were from five to ten Brothers, four or five Chaplains, and four clerks, had charge of all spiritual duties pertaining to the institution, chief among which were the performance of masses and various other offices of the church, besides attention to the spiritual necessities of the patients. On the other hand, the physical care of the patients, and the charge of all the domestic concerns of the hospital, fell to the Augustinian Sisterhood, at the head of which stood the Prioress, with about forty nuns, thirty novices, and sixteen servants under her control and direction.

The sisters, or "religeuses," who dedicated their lives to the services of the Hôtel-Dieu in the order of St. Augustine, not only took care of the sick patients, but did all the cooking, washing and the like for the whole institution. As a rule they entered upon their novitiate at any time between the ages of twelve and twenty, and as novices they served in various departments of the hospital for a period of five or six years, at the end of which time they were allowed to make their vows and take the veil. Their subsequent advancement depended on vacancies occurring in the ranks, promotions always being made regularly according to seniority. About four vacancies by death occurred each year, except in times of plague when they were much more numerous. Altogether, thirty or forty years of service in all the various departments were required before reaching the summit, namely, the office of Prioress or Under-Prioress.

The novices were given the most humble services, which were generally the hardest as well. The lowest task was the laundry work, next in order came the care of the patients' clothes, service as apothecary, and service in the linen room. The nuns had the nursing care of the patients; their duties in this province including washing the hands and faces of their charges, bed making, sweeping and other tasks of a like nature.

The novices on duty in the laundry encountered many difficulties in carrying out their task. In those days the Hôtel-Dieu stood immediately on the bank of the Seine, so that the water washed its walls. The place used as a laundry was a cellar whose floor was on a level with the surface of the river. In the wall fronting the river was a large arched opening, called the "Door of the Hôtel-Dieu," at which all the provisions, firewood and other supplies brought to the hospital in boats were unloaded, and

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here the novices knelt every morning to wash the soiled linen in the cold running water. In winter they performed this task by lantern light, often having to break the ice before they could begin. In summer the water frequently fell so far below the level of the cellar that it was impossible to wash the linen there, and it had to be carried to other places along the river bank, often to considerable distances from the hospital. In times of freshets or high water other difficulties presented themselves—some which are indicated by entries in the hospital records of payments made for the employment of a boatman to stand by in a boat ready to rescue with his hook such sheets—and sisters—as might be swept away by the swift and strong current.

Religieuses of all classes rose at five o'clock, and all alike were interrupted or relieved in the performance of their duties by masses and services held at various times throughout the day. The Prioress made rounds of inspection among the patients during the day and also two or three times in the course of the night, when the entire care of the hospital was entrusted to only seven persons, three nuns and four novices as a rule, whose hours of duty were from 7 P. M. to 6 A. M., their term of service lasting only one week at a time.

The strong and robust sisters remained in active service till death, but those who became invalids or too feeble with age to work were retired as "ancient sisters," and in separate lodgings were watched over and served by the other members of the order with the minutest care and attention during the remainder of their lives.

During the Middle Ages the revenues for the support of the Hôtel-Dieu were variously derived. Funds provided by the Church, State taxes, customs and duties, the proceeds of certain lotteries, sums contributed by royalty, all aided in the maintenance of the institution. The custom of leaving legacies to the Hôtel-Dieu had become so general as to constitute in itself a most profitable source of income; there was hardly a person of any rank whatever, who did not at his death bequeath to the institution some legacy, however small. Moreover, in those days the hospital was extensively patronized by the nobility, whose interest in its welfare led them, men and women alike, to make almost daily visits to it, leaving it richer as a result of the alms then freely given. The king also was a frequent visitor, inspecting the wards and bestowing alms liberally, both upon

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the hospital itself and upon individual patients. In addition to the sums of money obtained in those different ways, the Hôtel-Dieu was the recipient of numerous "privileges," exemplified by the royal order issued in March, 1209, to the effect that "the King (gives) to the Hôtel-Dieu the straw of his room and of his Palace of Paris every time he leaves the city to sleep elsewhere;" and by the order on the death of a queen to give to the Hôtel-Dieu "her bed and her room." The frequent gift to the hospital of the cradles of the royal children, when no longer needed, is another instance of the same sort.

During the period which up to this point has been under consideration, namely, from the foundation of the Hôtel-Dieu to the close of the Middle Ages, the hospital had been an efficient and satisfactory institution, according to the ideals then existing. Faithful and conscientious work had been performed by the nuns in the discharge of their various duties; the care and treatment of the patients had been consistent with the medical knowledge of the times and had called forth no adverse criticism. While scandals and abuses of various sorts had arisen from time to time, they had been neither frequent nor of such a character as to injure either the reputation or the efficiency of the hospital. The interest of wealthy Parisians in the management of the institution, and their custom of making frequent visits had assisted in the maintenance of a universally approved standard. But towards the close of the fifteenth century the hospital entered upon a period of gradual demoralization which ended in its becoming a by-word by reason of the abuses which crept into its administration in both spiritual and temporal matters. In the reign of Louis XI (1461-1483) grave disorders began to prevail in the internal management, and were widely reported. Large sums of money were paid out without due consultation of the Chapter of Nôtre Dame. Both Master and Prioress seemed to have lost control of the priests and nuns under their charge. New members were admitted to the orders and vows taken without proper consultation of the heads. Among the nuns various factions had risen—each nun as a "mother in religion" had in charge a certain number of novices for whose training she was responsible, and this practice led to a condition of affairs in which the whole sisterhood became broken up into rival parties. If a novice were changed from one department of the hospital to another, she became insurbordinate to the "mother in religion" to whose supervision she had been trans-

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ferred, and there ensued talebearing and general demoralization beyond the power of the Prioress to control. The nuns came and went from the Hôtel-Dieu at their own will, without notice or permission. Undue intimacy existed between the priests and the sisters. Endless quarrelling, extravagance, and abuses of all sorts were the order of the day. Not only did the sick who were already within the hospital suffer from this state of affairs, but in the general laxity and demoralization it came about that sick persons justly entitled to the services of the institution were rejected on account of the very poverty which constituted their claim to admission, while unworthy persons were received because of their ability to pay.

The Chapter of Nôtre Dame proved unable to cope with the situation, and was finally induced by the scandals and complaints arising from this condition of things to appeal to the municipality of Paris for aid. The outcome was that in 1505, Louis XII, who had by that time succeeded to the throne, created the Bureau of Nôtre Dame, consisting of "twelve notable bourgeois," who were to take over the entire control of everything pertaining to secular matters in the administration of the hospital.

The establishment of this Bureau proved to be the beginning of a fierce struggle between Church and State for the control of the hospital—a struggle which lasted from 1505 to the French Revolution, and in which the Church was a gradual but steady loser. Both parties assumed the offensive and carried their enmity into its most petty details.

From the outset the Bureau was unable to find any efficient method of suppressing the abuses with which it had to deal. It met and deliberated upon each complaint, whether grave or trivial, which was brought before it, and issued an order for its remedy—a method of procedure which was entirely ineffectual. From time to time the Bureau appealed to the King as a last resort. Although before the establishment of the Bureau there had been civil strife between the priests and the sisterhood, they now laid aside their quarrels to unite against the secular authority which they regarded as their common enemy. The struggle for and against reform never ceased from this time on. Sometimes it was bitter, sometimes merely grotesque, as in the controversy which lasted during several months of the year 1663. The Bureau had caused a set of rules of its own making to be posted on the door of the maternity ward. The Prioress promptly gave orders to tear them down. The Bureau met and

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decreed that the rules be posted again in the same place, whereupon the placard was defaced with mud. Again the Bureau deliberated upon the situation, remonstrated, and replaced the rules. This time they were hidden from view by a crucifix, which last move so exasperated the members of the long-suffering Bureau that they appealed to the King. In response to their application the King threatened to deprive the Augustinian Order of all its privileges on the occasion of its next interference with the decisions of the Bureau, and this threat put an end to the episode. Another example of the attitude of the Prioresses toward the Bureau may be found in their persistent refusal to furnish the statistics for which it asked. Any effort on its part to ascertain the exact number of the religeuses connected with the Hôtel-Dieu was always met by evasions or by the pretext that the Prioress had forgotten the number of nuns and novices under her rule.

A brief survey of the conditions after the establishment of the Bureau in 1505 reveals the following facts and circumstances. The sisters, it seems, had come by degrees to ignore the fact that their order had been created for the express purpose of providing the Hôtel-Dieu with a nursing staff, and instead of attending to the duties properly theirs, had betaken themselves to a course of life suitable only to regular cloistered nuns, spending their time in prayer, contemplation and attendance on the services of the church. The visits of the sisters to the sick in their charge became perfunctory; it was said that they passed from bed to bed "looking without seeing," and paying no heed to the appeals or wants of the patients, especially during plague epidemics, when the hospital was full to overflowing.* The duties of bed making, cutting the hair and cleaning the nails of patients, and the like, were neglected, even though a crowd of convalescents had been retained in the hospital in order that they might perform tasks which properly belonged to the nuns. Moreover, the sisters disregarded the orders of the physicians in attendance or even acted in direct opposition to them. Instead of furnishing patients with the diet prescribed for them, they substituted other food, which was often totally inappropriate. Thev insisted on the observance of Friday as a fast day, and accordingly gave to the patients on that day food which was either not sufficiently nourishing for persons in their condition, or which was otherwise

*In 1562 the number of deaths in the Hôtel-Dieu was 68,000.

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unsuitable. Again, if the sister in charge of a department happened to be opposed to any form of treatment ordered—bleeding, blistering, the administration of particular drugs—she set aside the physician's orders without hesitation. In connection with this attitude towards the physicians may be mentioned a provoking discrimination against them in regard to the maternity ward. This was served by a midwife and her apprentices, the nuns being excluded by the rules of the order, and was the only place in Paris where practice in obstetrics could be obtained; but except for the surgeon of the Hôtel-Dieu and his chief associate, doctors were rarely admitted, though priests might enter whenever their services were deemed necessary. Again, since autopsies were held in abomination by the nuns, the Prioress, who had control of the matter, frequently refused permission to make them, thus placing another obstacle in the way of the physicians.

Abuse of the hospital buildings was also a source of complaint. The custom of stationing a nun at the door to admit patients had fallen into disuse, and in the absence of any surveillance thieves and vagabonds of all sorts entered and used the hospital as a rendezvous, thereby giving rise to infinite scandal and annoyance.

The hospital supplies of food were misappropriated and misused in various ways. A large quantity of food was taken for the use of the convalescents already mentioned, who were retained by the nuns to perform duties which they themselves wished to avoid. These persons, of whom there were about 200, besides consuming food to which they had no right, occupied places which should have been reserved for the sick, so that their presence was a detriment to the patients as well as a source of unwarranted expense to the hospital. The Bureau appealed to the doctors to discharge these convalescents, but as they were hurried out of sight whenever the doctors made their rounds, the latter replied in all sincerity that they knew of no such persons. Some of the convalescents were accustomed to realize petty sums by selling part of their food to patients too ill to earn it for themselves. Another evil arising from the practice of giving food in compensation for work was that patients barely recovered would work beyond their strength in order to obtain this reward, often thereby suffering a relapse into their former condition, so that some of the inmates of the hospital would alternate for years as patients and workers. Complaint was also made that the nuns

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appropriated for their own benefit the sugar supplied to the pharmacy for use in the manufacture of medicinal syrups.

By the close of the fifteenth century the Hôtel-Dieu had long since departed from its original purpose of affording shelter to all who required it, whether sick or well, and had become a hospital in the modern sense of the word only. In the sixteenth century a further restriction was made by limiting the admission to fever cases (*aigues*). This limitation was rendered possible by the opening of other hospitals. In 1607 two hospitals were established for use in epidemics of contagious diseases. Another for convalescent women was established in 1647 in the Rue de Bucherie, near the Hôtel-Dieu, and mention has already been made of the children's hospital founded in 1535. The organization of these different institutions relieved the Hôtel-Dieu somewhat, though the number of its patients continued to grow steadily. In 1663 the number received was 2,500, and down to 1786 there was an increase of about 500 for every hundred years, so that in the year last mentioned the enormous figure of 4,000 was attained. The figures given are not those of pestilence years, but of ordinary times and conditions only.

Two fires which occurred during the eighteenth century were important episodes in the later history of the Hôtel-Dieu. The first of these took place in 1737, and though apparently not extensive, it claimed a number of victims, including many nuns who lost their lives in trying to save patients.* The burnt portions of the buildings were soon rebuilt, but after this the Hôtel-Dieu, with its large mass of haphazard structures, was looked upon as a menace to the public safety. The second fire, in 1772, proved that these fears were not without foundation. This time the fire was very extensive and lasted for eleven days. The Cathedral of Nôtre Dame, close at hand, served as a refuge for 450 of the patients, but, according to eye-witnesses, between 600 and 1,000 were burned to death. This report, though officially denied, was confirmed by the large number of human bones found in the debris. The hospital was promptly rebuilt, the new structures being a great improvement over the former ones.

Conditions existing in the Hôtel-Dieu in 1786 are graphically depicted in Tenon's report, a portion of which is herewith trans-

*This fact seems to indicate that whatever the shortcomings of the sisterhood might be in regard to matters affecting the ordinary welfare of the patients, their sense of responsibility was, nevertheless, great enough to inspire them to deeds of heroism in emergencies.

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lated. "The convalescents had a ward on the third floor, to which there was no access save through the ward where the smallpox cases were. The insane ward was next to that of those who had suffered the most cruel operations and who could obtain no repose owing to the cries that they heard night and day. Cases of contagious diseases were placed in the same ward as others—women having smallpox were placed among fever cases." Owing to the filthy condition in which the patients were kept, scabies was rampant in the hospital. "Drinking cups, rinsed in haste, are passed from patients who have the itch to those who are free from it. A new patient is often placed in the bed of an itch patient who has just died, the sheets being unchanged. The itch is almost general and perpetual at the Hôtel-Dieu, the surgeons, nuns, and hospital attendants contracting it in caring for the patients and in handling their linen. Discharged patients carry it to their families. The Hôtel-Dieu is the undeniable source from which this disease spreads in Paris.

"This is not all; in the ward used for the men with smallpox, the same bed sometimes contains six men or eight children. The operating (surgical) ward, where they trepan, where they cut for stone, where they amputate limbs, contains not only those upon whom operations are being performed, but those who have already undergone them, and others who are awaiting their turns. The operations are performed in the middle of the ward; one can see the preparation of the victims and hear his cries of torment. He who is to be operated on next day has before him a picture of his future sufferings in those of him who has just passed through this terrible ordeal.

"The ward of St. Joseph is reserved for pregnant women; honest or vicious, healthy or unhealthy, they are all together. Three or four women in this state lie in the same bed, exposed to insomnia, to contagion from their diseased neighbors, to the risk of injuring their children. The women, after delivery, also are put four or more in a bed, in various stages of recovery. The gorge rises at the idea of this situation, where they mutually infect each other. Most of them either die or go out diseased.

"Besides all the other causes which tend to infect the air of the hospital, when the straw of the beds has to be changed, there is no special place for doing this; it is done consequently in the middle of the wards. When these straw mattresses whereon so many different sorts of diseased patients have been lying are opened, one can imagine the odor that is exhaled. Further, in each ward

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loose straw is used for the dying patients and those that soil their beds. Sometimes five or six are put together on a pile of straw, which is placed on a bed and covered with a sheet. It sometimes happens that a newcomer is placed among these dying or filthy patients until a permanent place for him is decided on. One must be at the Hôtel-Dieu four o'clock in the morning when they take out this infected straw by armfuls, and throw upon the floor that which is reeking with impurities and loaded with filth, to judge of the infection which spreads throughout the wards and the stairway on all the floors. A thousand factors, special or accidental, add each day to the ever present causes of the corruption of the air, and force one to the conclusion that the Hôtel-Dieu is the most unhealthful and most dangerous of all hospitals—that out of nine patients two die."

This vivid description appears to us the more shocking when we recollect that the period of which Tenon writes antedates the present by but little more than a hundred years. It brings us to realization that at the end of the eighteenth century the conditions prevailing at the Hôtel-Dieu were worse, if anything, than those which had existed at the beginning of the thirteenth, and that the opprobrium heaped upon this venerable institution was not without due cause.

The state of affairs described by Tenon was represented to the king, Louis XVI, who, after reading and listening to various accounts of the frightful condition of the hospital, issued an order that every patient be given a separate bed. However, as no means were provided for the carrying out of this order, it was of no effect. In 1786 a committee was appointed to raise funds for the erection of four other hospitals of 1,200 beds each, by which it was hoped that the congestion of the Hôtel-Dieu might be relieved. But although enormous sums of money were collected, they were never used for the purpose intended. Fruitless as this agitation seemed at the time, it nevertheless helped to hasten the day of individual beds. In the year IX (1801) the government issued an order for the making of several hundred single beds to be used in the hospital; also, since it was difficult to abandon wholly the traditions of the past, for a few beds which should contain two persons each, though even in this case the two were separated by a partition.

At this time also the first operating room used by the hospital was built, and thenceforth operations were no longer performed in the wards.

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The history of the Hôtel-Dieu from the end of the eighteenth century to the present day presents but few features of special interest. About thirty years ago it was entirely rebuilt, with the exception of two pavilions. The new structure is of stone, built on the block system, each block being several stories high. Its twenty-five wards accommodate something over 800 patients, with medical, surgical, obstetrical and ophthalmic services. Except for such shifting as was incident to the enlargements and rebuilding that have taken place from time to time, to the opening and closing of streets in the neighborhood, and to changes in the river frontage, the hospital stands on its original site on the Ile de la Cité, close to the Cathedral of Nôtre Dame and to the River Seine, both of which have been intimately connected with its history. The new buildings, however, do not stand directly upon the bank of the river; their main façade fronts it, but the square of Nôtre Dame lies between. The Augustinian nuns still retain their ancient place in the administration of the hospital, but the municipal control which had its beginning in the royal order of 1505, and which for the last 400 years has been fighting for the mastery, has at last assumed the entire management of the institution. Moreover, owing to the influence of the spirit of hospital reform which has awakened in France within the last few years, the severance of the Augustinian nuns from their birthright in the Hôtel-Dieu is imminent, and its consummation will probably be the last chapter in the memorable history of this order, the life of which has up to now been identical with that of the most ancient hospital in existence.

A SKETCH OF BENJAMIN RUSH.

By Henry Goodwin Webster, M.D.,
Brooklyn, New York.

AT a meeting of this Association held some four or five years ago, there was presented for your consideration by an eminent member of our organization a paper of more than usual interest dealing with one of medicine's great luminaries—Ambrose Paré. Since then I have frequently thought that in the great volume of contemporary medical contributions it would be well now and again to devote an occasional thought to those who have helped make medical science what

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it is. My own ignorance of medical history has been my chief impulse in this consideration and is urged in partial apology for the present address. If in imitating what has been once done so well I may help to establish an annual custom I shall feel gratified.

Among the names that we repeat from the infancy of American medicine none looms greater than that of Benjamin Rush, profound thinker, sturdy patriot, eloquent speaker, courtly gentleman and brilliant physician. The details of his life and the records of his achievements are too well known and have been too often heralded to detain us now, except in briefest recital. It is his place in the American Commonwealth and the lessons of his character that must engage our attention to-night.

Rush was born near Philadelphia, December 24, 1745, received his preliminary education at Nottingham, a little village in Maryland, was graduated from Princeton in 1760 when not quite fifteen, was then apprenticed to Dr. Redman, eminent at that time in Philadelphia, and spent six years under his tutelage, at the same time attending that first class in anatomy conducted by Dr. Shippen. In 1766 he went to Edinburgh, where Cullen dominated the medical world, receiving his M.D. in 1768. The next few months were passed in London and Paris, and on his return to Philadelphia in 1769, he was appointed Professor of Chemistry in the College of Philadelphia, being then only twenty-four years old. When by merger with the University of the State of Pennsylvania, which temporarily superseded the College, the University of Pennsylvania was formally established in 1791, he was appointed to the Chair of the Institutes of Medicine and Clinical Medicine and in 1797 he added the Chair of Practice, and continued giving one and sometimes two lectures daily, besides his hospital visits and immense private practice, until his death in 1813. In 1766 he was a member of the Provincial Conference of Pennsylvania and is thought to have drafted its report in favor of independence. This was so like the Declaration of Independence of July 4, that Rush, who was a few days previously appointed to the Congress, may be said to have suggested that document, at least in part. Franklin voiced the situation when he declared "We must hang together or hang separately." It speaks highly for Rush's patriotism that he gladly accepted a position the full responsibilities of which he clearly foresaw. In like spirit he accepted the duties of Surgeon General of Military Hospitals for the Middle

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Department in the following April, and in August, 1777, those of Physician General. He lacked, however, the unswerving constancy of Washington, for he resigned after the disasters that led up to Valley Forge and seems to have failed to grasp the real greatness of that magnificent man, for in his letters to Adams and Patrick Henry he endeavored to discredit the Commander-in-Chief and to further the interests of Conway and his cabal. Let us believe that he truly thought he was acting for the best, even when he stooped to indirection and deceit. Others in public station lost faith in Washington, the Congress itself failed him, the future hid its fruition and Rush was only human, after all. Apart from this he labored faithfully and with keenest foresight for the establishment of the Constitution and the betterment of the laws and did not cease his efforts for the public good until the Republic was firmly established. That his services were great and his integrity widely known is witnessed by his appointment as Treasurer of the Mint, and when he died his son succeeded him, because of his father's greatness.

In August, 1793, yellow fever appeared in Philadelphia, and raged with awful violence. When the October frosts at last appeared it had swept away four thousand victims—a full tenth of the population. Those that could fled, even to the doctors, leaving the burden greater still on those who stayed, Rush among them. Though he had by now achieved wealth and fame he refused to go, sent his family away, and with three of his students did what he could against the pestilence. One pupil died and Rush himself was seized, but recovered. Like his colleagues, he soon found the prevailing mode of treatment futile and with characteristic energy cast about for something better. In a manuscript of a Dr. Mitchell, of Virginia, describing a yellow fever epidemic in 1741, he found this remark: "Evacuation by purges is more necessary in this than most other fevers, and an ill-timed scrupulousness about the weakness of the body is of bad consequence in these urging circumstances. . . . I can affirm that I have given a purge in this case, when the pulse has been so low that it could hardly be felt, and the debility extreme; yet both one and the other have been restored by it." Acting on this hint he took his courage in both hands and gave to his next five patients ten grains of calomel with fifteen of jalap. Four promptly recovered and Rush announced to the College of Physicians the result of his discovery and also published it broadcast. He added to this gentle treatment blood letting, cool air,

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cold drinks, low diet, and applications of cold water to the body—"remedies to abstract excess of stimulus from the system," as David Ramsay quaintly puts it. Rush firmly believed in the virtues of this treatment, for in his note-book, under date of September 10, we find him exclaiming, "Thank God! out of one hundred patients whom I have visited or prescribed for this day, I have lost none." One immediate result was an enormous accession to his practice. Between the 8th and 15th of September he saw from one hundred to one hundred and twenty patients a day.

Many he prescribed for as he sat at table. Many more he had to refuse—forty-seven before eleven o'clock one morning. His sister succumbed to the disease, but he still held his post. With all this he yet made time to keep an accurate account of the epidemic, which was published at home and when copied in Europe brought him substantial honors—a coronation medal from the King of Prussia, a letter from the King of Spain and a costly diamond from the Emperor of Russia. At home, however, he met with far different treatment. While he reaped much of honor and reputation, his garland held many a thorn. He declared for the non-contagious character of yellow fever, proclaiming the epidemic to be engendered in Philadelphia, born of and fostered by its filth. This roused the fury of the merchants, who saw the ill repute their city must endure and shuddered for their profits, while many of his colleagues bitterly denounced his practice and assailed his personality. In their malignancy they stooped so low as to hire one William Cobbett, who was paid to publish a paper, *Peter Porcupine's Gazette.* The slanders this contained at last aroused Rush to bring suit, which resulted in a favorable verdict and $5,000 damages which Rush gave to the poor. Cobbett went to New York and continued to lampoon the great practitioneer in the *Rushlight.* It died after a time, but scorched so long as it flickered. Rush's advocacy of bleeding, which he firmly believed in and practiced generously, furnished a ground for these attacks and paved the way for the disrepute it now holds, though there is every reason to believe that in his hands it was judiciously used and accomplished much good. His eulogist, good old Dr. David Ramsay, brings forward many ponderous arguments in its favor and cites some astonishing sacrifices in the good cause: as, "Mr. Cline drew 320 ounces of blood in twenty days from a patient in St. Thomas' Hospital, who labored under a contusion of the head.

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A gentleman at Angola lost between three and four pounds daily from his nose; to cure it he was bled ninety-seven times in one year. A young woman was bled ten hundred and twenty times in nineteen years, to cure her of plethora, which disposed her to hysteria." Truly there were giants in those days!

The debt of American medicine to Benjamin Rush, however, rests on very different ground. When Rush entered medical life the methods of the Middle Ages had hardly disappeared. Boerhaave, in Holland, and Haller, at Berne, had hewn out paths toward rational notions in medicine, but the chemical and physiological laboratory was unborn and speculation perforce replaced knowledge. System was everything. Hypothetical reasoning strove to whip into line such empirical sparks as glimmered in the mist, and first this and then that teacher rose to prominence as his "system" appealed to the student body. Rush studied at Edinburgh under Cullen, whose "system" at that time was in the ascendant. Boerhaave had taught that disease was located in the body fluids. Cullen regarded the body solids as at fault and believed that they were acted upon by the nerves. He further elaborated a "Genera Morborum," endeavoring to reduce diseases into orders, classes, genera and species. His students were thus educated to recognize 1387 different diseases, of which some, to paraphrase St. Paul, remain unto this present, but the greater part have fallen asleep. Through this darkness Rush groped protesting, strove to better it, and exclaimed upon the advent of the Brunonian system, "I see a gleam of light." That this was a feeble beam is evident, for Brown, discarding local lesions, reduced everything to two diatheses, the sthenic and the asthenic. As the latter was by far the greater, stimulation became the *sine qua non* of successful treatment and elevated tonics, especially alcohol, to a commanding eminence. (Hence the popularity of Scotch whiskey.) Choosing the good from the teachings of both of these men, Rush boldly declared for a more sensible appreciation of the essentials of disease, discarded nosology and taught his pupils to deduce the nature of the morbific process from the character of the pulse, temperature and respirations, and from the other evidences of disease. He believed that treatment should be either depleting or stimulating, depending, as Ramsay puts it, on his understanding that diseases "in their numerous forms occur in morbid excitement, induced by irritants, acting on debility." He further greatly simplified the materia medica and reiterated the value of a thorough knowledge of a limited arma-

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mentarium. Calomel, he proclaimed as the Samson of the materia medica, to which even his enemies agreed, saying, "it has slain its thousands." But above all he taught the value of fresh air, bathing, simple diet and wholesome exercise—the reconstructive power of unencumbered nature. He seems to have grasped the force of Poor Richard's epigram, "God heals, and the doctor takes the fees." Beyond this he emphasized the value of the study of those local conditions which so markedly affect the form of disease and declared that European treatises were inadequate for a thorough knowledge of sickness in America. His first published paper dealt with the natural history of medical practice among the Indians of North America, and a considerable number of his subsequent communications were on the characteristics of disease as seen in Pennsylvania.

His versatile mind embraced all phases of medical practice. One of most valuable contributions was his volume of "Medical Inquiries and Observations on the Diseases of the Mind," his last published work. That he grasped the possibilities of relief from mental diseases is evidenced by even a cursory examination of this essay. Although the book reflects the pitiful ignorance of the times in many of its quaint absurdities, it yet shows that he realized the power and value of mental suggestion, kindness, and dietetic and hygienic treatment. He believed that marriage went far toward preventing madness, as allowing little leisure for introspection, and remarks, "Celibacy is a pleasant breakfast, a tolerable dinner, but a very bad supper;" and he thought that the stress of poverty helped to preserve the poor from lunacy. Its essential cause he thought to be "seated primarily in the blood vessels of the brain."

Besides those compositions of a strictly medical nature he published a number of essays directed toward the education of public sentiment on a broad variety of subjects. That by these means he placed himself in the public eye and that they brought him in substantial returns cannot be doubted. It was broadly hinted that such means of professional advertising smacked of quackery and they certainly helped to fan the flame of professional jealousy that later kindled into the *Rushlight*. But dispassionate analysis of his motives, an appreciation of the depth and breadth of his character, and some thought on the vices and ignorance of his time, especially as regards the science of health, taken with the narrow formalism and self-satisfaction of the average practitioner of the period will go a long way to prove that far from self seek-

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ing, he acted often against his own interest, impelled by something of that spirit of scientific unrest that has been the wellspring of modern progress. Convinced of the harm of strong drink in an age when every gentleman got tipsy he boldly attacked the evil, even to the point of warning his pupils to avoid using alcoholic tinctures except in drop doses. Even the great Washington kept slaves; yet Rush, at that early date, foreshadowed the horrors of 1861 and spoke with no uncertain voice for emancipation. In a time when the accomplishments of a lady were embroidery, housework and pouring tea he urged the establishment of seminaries for young women. He spoke for public schools, and is counted a founder of Dickinson College. His efforts went to mitigate the degradation of penal servitude. The Philadelphia Dispensary owes its inception to him. Through all he kept untarnished and unblemished the character of a courtly gentleman, a teacher of lofty ideals, a real piety and a firm adherence to his religion. He was liberal, seeing good in all creeds, while he declared, "I am neither aristocrat or democrat—I am a Christocrat. I would rather see the opinions of Confucius or Mohammed inculcated upon our youth than see them grow up wholly devoid of a system of religious principles."

Is it wonderful, then, that on his death Jefferson wrote, "another of our friends of '76 has gone; another of the co-signers of our country's independence; and a better man than Rush could not have left us; more benevolent, more learned, of finer genius or more honest," or that he was publicly mourned almost as Washington had been?

A FORGOTTEN MEDICAL WORTHY, DR. DIEGO ALVAREZ CHANCA, OF SEVILLE, SPAIN, AND HIS LETTER DESCRIBING THE SECOND VOYAGE OF CHRISTOPHER COLUMBUS TO AMERICA.

By A. M. Fernandez de Ybarra, A.B., M.D.,
New York City.

ITH Christopher Columbus, on his second voyage of discovery to America, in the year 1493, there came Dr. Diego Alvarez Chanca, a distinguished practitioner of much learning and professional skill, who held the position of physician-in-ordinary to the King and Queen of Castile and Aragon, and had attended their first-born child, Princess

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Isabella (who afterward became Queen of Portugal), during a serious illness the year before. He was a native of the city of Seville, and had been especially appointed by the Spanish monarch to accompany that expedition, not only on account of its great political and commercial importance, but also because among the 1,500 persons who came over from Europe to America in that fleet were several distinguished personages and a large number of aristocratic young gentlemen, restless and daring warriors who had done excellent service in the war just ended against the Moors.

Among those men of distinction who came over from Spain to America in that expedition may be mentioned the following: Juan Ponce de León, the future conqueror of Porto Rico and later the discoverer of Florida and of the Mississippi River; Alonso de Ojeda, the future discoverer and explorer of the north coast of South America, with whom Amerigo Vespucci made his first trip to the New World; Pedro Margarit, the subsequent discoverer of the archipelago to which he gave the name of the Marguerite Isles; Juan de la Cosa, the expert cosmographer, author of the first map of America in existence, drawn by him in the year 1500 and now in the Royal Naval Museum at Madrid; Antonio de Torres, a brother of the nurse (*aya*) of Prince Juan; the father and the uncle of Fray Bartolomé de las Casas, the celebrated Spanish historiographer of America, who was the greatest friend the American Indians have ever had; Bernal Diaz de Pisa, the accountant or treasury official of the expedition; Diego Marquez, the overseer of the flotilla and master of one of the caravels; Fermín Zedo, an expert metallurgist; Villacorta, a noted mechanical engineer; Francisco de Peñalosa; Ginés de Gorbalán; Sebastián de Olano; Juan Aguado; Gaspar Beltrám; Juan de la Vega; Pedro Navarro, and Melchoir Maldonado. Other equally distinguished persons who came over in the second voyage of Columbus to America were: Fray Bernal Boil, apostolic delegate of Pope Alexander VI, accompanied by twelve Fathers belonging to different orders, among whom the most prominent were Fray Román Pane, Fray Juan de Tisín, and Fray Juan de la Duela, familiarly called *el Bermejo,* on account of his red hair. Columbus' youngest brother, Diego, who had come from Italy to Spain, attracted by the fame and success of Christopher, was also among the voyagers.

As an able practitioner of medicine, Dr. Chanca showed his skill by saving the life of Christopher Columbus, who suffered a very dangerous attack of typhus fever on one occasion and

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pernicious malarial fever on another occasion, as well as the lives of many Spanish hidalgos who were at the point of death as victims of disease during their stay at the island of Hispaniola or *Haití*, as the aborigines called it.

The second expedition was altogether different from the one sent out the previous year in quest of a new passage to the Indies. Instead of the three small caravels, carrying only 120 persons, which accomplished the most transcendental event in the history of humanity—the discovery of the Western Hemisphere—this flotilla was composed of three great galleons or carracks and fourteen caravels of different sizes. It was well provided with all the requisites for the establishment of a permanent settlement in the land that had been discovered the year before. Even 20 horses for as many lancers (which played a most terrorizing influence among the American Indians) were also on board those vessels.[1]

On their arrival at the island of Hispaniola or Santo Domingo —where the year before Columbus had left 38 men under the military command of his brother-in-law, the hidalgo Diego de Arana Enriquez, and under the professional care of Maese Juan, one of the two ship surgeons who accompanied him, all lodged in an improvised little wooden fortress constructed with the remains of the caravel *Santa María*, wrecked on the reefs of the shore—Dr. Chanca wrote in the Spanish language of the fifteenth century his famous letter to the Municipal Council or *Cabildo*[2] of his native city, which manuscript is unquestionably *the first written document about the flora, the fauna, the ethnology and the anthropology of America.*

Dr. Chanca's letter was written at the port of Isabella during the last days of January, 1494; it left that port February 2, in care of Don Antonio de Torres, commander of the twelve vessels sent back by Columbus to Spain with the news of the discoveries, and arrived there April 8, 1494. Therefore, everything

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[1] A ship surgeon, or *físico* (physicist) as that marine officer was then called in Spain, and a pharmacist, whose names I have been unable to ascertain, also came over to the New World in that great expedition of the Spaniards.

[2] This is the name the corporation of a town was then called in the Spanish dominions, equivalent to *Chapter*, after the chapter of a cathedral or collegiate church. It is now called the *Ayuntamiento*, and is composed of a *Corregidor* or *Alcalde*, and several *Regidores;* the first corresponding to Mayor, and the latter to Aldermen.

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he says in it regarding those just discovered islands of the New World he learned in the short space of time between November 3, 1493, when he saw the first island (Dominica), and the last week of January, 1494—that is, in less than three months.

On his return to Spain Dr. Chanca published, in the year 1506, a treatise entitled "Para curar el mal de costado" (The Treatment of Pleurisy) and a commentatorial work in Latin, criticising the book entitled "De Conservanda Juventute et Retardanda Senectute," whose author was another celebrated Spanish physician named Dr. Arnaldo de Villanova. The title of the second work of Dr. Chanca is "Comentum novum in Parabolis divi Arnaldi de Villanova," which was printed in Seville, the year 1514. Dr. Chanca also supplied personal information to Father Andrés Bernaldez, the accomplished parish priest of the town of Los Palacios and chaplain to the Archbishop of Seville, which enabled Bernaldez to give many important details of this expedition of the Spaniards in his famous historical work entitled "Chronicles of the Catholic Kings."

Let us now proceed to some scattered paragraphs, translated by me from the Spanish letter of Dr. Diego Alvarez Chanca, addressed to the municipal authorities of the city of Seville, considered by competent judges to be a most remarkable document and the best description of the first part of the second voyage of Christopher Columbus to America. I have added a few explanatory notes, geographical and historical remarks.

"Since the occurrences which I relate in private letters to other persons are not of such general interest as those which are contained in this epistle, I have resolved to give you a complete narrative of the events of our voyage, as well as to treat of other matters which form the subject of my petition to you. The news I have to communicate is as follows:

"The expedition which their Catholic Majesties sent, by divine permission, from Spain to the Indies, under the command of Christopher Columbus, admiral of the ocean, left Cadiz on the twenty-fifth day of September, in the year 1493, with wind and weather favorable for the voyage. This wind lasted two days, during which time we managed to make nearly fifty leagues. The weather then changing, we made little or no progress for the next two days; it pleased God, after this, to restore us fine weather, so that in two days more we reached the island of

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Great Canary. Here we put into harbor, which we were obliged to do to repair one of the ships that made a great deal of water. We remained all that day, and on the following set sail again, but were several times becalmed, so that four or five days more passed before we reached the island of Gomera. We had to remain at Gomera one day to lay in our stores of meat, wood, and as much water to drink as we could stow, preparatory for the long voyage that we expected to make without seeing land.[3] Thus it happened that through the delay at these two ports, and being calmed the day after leaving Gomera, we spent nineteen or twenty days before we arrived at the island of Ferro.[4]

"After this we had, by the goodness of God, a return to fine weather, more continuous than any fleet ever enjoyed during so long a voyage; so that leaving Ferro on the thirteenth day of October, within twenty days we came in sight of land, but we should have seen it in fourteen or fifteen days if the ship *Capitana*[5] had been as good a sailer as the other vessels, for many times the others had to shorten sail because they were leaving us much behind. During all this time we had great fortune, for throughout the voyage we encountered no storm, with the exception of one on St. Simon's eve, which for four hours put us in considerable danger.[6]

"On the first Sunday after All Saints' day, namely, the third

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[3]From that island of Gomera Columbus embarked eight pigs, bulls, cows and calves, sheep and goats, fowls and pigeons, seeds of oranges, lemons, bergamots, citrons, pomegranates, dates, grapes, olives, melons and other European fruits, as well as all kinds of orchard and garden vegetables. All these were the origin of their species in the New World. The expedition likewise carried implements of husbandry, and medical and surgical supplies of all kinds, shipped before leaving Spain.

[4]This is the southwesternmost of the group of the Canary Islands, formerly called the Fortunate Islands, and is named in Spanish *Hierro*.

[5]That vessel was a galleon (in Spain what was really known then as a *nao* like the *Santa Maria* of the first voyage), of 400 tons burden, that carried the Admiral's flag, and in which Dr. Chanca made the trip.

[6]They believed themselves in much peril that evening, October 27th (as they certainly were in such a sudden and fierce storm, accompanied by heavy rain, rapid lightning and great peals of thunder, which are so frequent in the tropics), until they beheld several of those lambent flames called by sailors "St. Elmo's tapers," playing about the tops of the masts and gliding along the rigging, which are occasionally seen about tempest-tossed vessels during a highly electric state of the atmosphere. The sailors consider that phenomenon one of good omen.

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of November, about dawn, a pilot of the *Capitana* cried out: 'The reward, I see land!'[7]

The joy of the people was so great, that it was wonderful to hear their cries and exclamations of pleasure and they had good reason to be delighted, for they had become so wearied of bad living, and of working the water out of the leaky ships, that all sighed most anxiously for land. The pilots of the fleet reckoned on that day that between the time of leaving the island of Ferro and first reaching land, we had made 800 leagues;[8] others said 780, so that the difference was not great, and 300 more between Ferro and Cadiz, made in all 1,100 leagues.[9] I do not, therefore, feel now as one who had not seen enough water.

"On the morning of the aforesaid Sunday we saw lying before us an island, and soon on the right hand another appeared. The first was high and mountainous on the side nearest to us; the other was flat and very thickly wooded.[10] As soon as the light of day became brighter other islands began to appear on the right and on the left of us, so that that day there were six of them to be seen lying in different directions, and most of them of considerable size. . . .

"This Island of Marigalante is filled with an astonishing thick growth of wood; that variety of trees being unknown to us, some bearing fruit and some others flowers. It was surprising to see that, and, indeed, every spot was covered with verdure.

"We found there a tree whose leaf had the finest smell of cloves that I have ever met with. It was in shape like a laurel leaf, but not so large; I think it was really a species of laurel.[11] There were wild fruits of various kinds, some of which our men, not very prudently, tasted; and on only touching them with their tongues, their mouths and cheeks became swollen, and they suffered such a great heat and pain that they seemed by their

[7]The Spanish government had offered a reward in money to the first person who would see land in this voyage, the same as it had done in the first voyage of discovery to America.

[8]That is to say, 2,400 Spanish miles, or about 2,057 English miles.

[9]Three thousand three hundred Spanish miles, equivalent to about 2,829 English miles.

[10]It was the island to which Columbus gave the name of Marigalante, the real name of the galleon *Capitana*. It has an area of 60 square miles and belongs to France.

[11]Probably it was the *Kalmia angustifolia* or "Laurier des Montagnes," as it is called in the French West India Islands.

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actions as if they were crazy, and felt obliged to resort to cooling applications to ease the pain and discomfort.[12] . . .

"These islanders appear to us to be more civilized than those who had hitherto been seen before, for although all Indians have houses made of straw,[13] yet the dwellings of these people are constructed in a much superior fashion, better stocked with provisions, and exhibit more evidence of industry, both on the part of the men and of the women. They had a considerable quantity of cotton, already spun and prepared for spinning, and many cotton blankets, so well woven as to be in no way inferior to similar ones made in our country.[14] . . .

"We were able to distinguish which of the women were natives of these islands and which captives, by the distinction that a Caribbee woman wore on each leg two bands or rings of woven cotton, one fastened around the knee and the other around the ankle, by this means making the calves of their legs look big and the above-mentioned parts small, which I imagine they do because they believe this sort of adornment makes them pretty and graceful; by that peculiarity we distinguish them.

"The captive women told us that the Caribbee men use them with such cruelty as would scarcely be believed; and that they eat the children which they bear to them, only bringing up those which they have by their native wives. Such of their male enemies as they can take away alive, they bring here to their homes to make a feast of them, and those who are killed in battle they eat up after the fighting is over. They claim the flesh of man is so good to eat that nothing like it can be compared to it in the world; and this is very evident, for of the human bones we found

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[12] I believe those poisonous fruits were a species of small apple called in Spanish *manzanillo*, or in English manchineel tree (*Hippomane mancinella*), which is still to be found in the West India Islands. The fruit of the manchineel tree produces similar effects to those here described by Dr. Chanca, also vomiting and purging. The shadow cast by the foliage of this wild tree raises a blister on the skin, the same as the guáo (*Rhus metopium*), which is a wild shrub, very abundant in the Antilles.

[13] Dr. Chanca makes a mistake here. The houses of the native Indians of the Antilles were not made of straw, but almost exclusively of the component parts of the royal-palm tree (*Oreodoxa regia*). He probably considered the Indian houses made of straw because they certainly had that appearance, and in the short space of time in which he had to observe them he did not have the opportunity of seeing one in process of construction.

[14] The Caribbee Indians possessed also the art of making household utensils of clay, which they baked in kilns like the potters of Europe.

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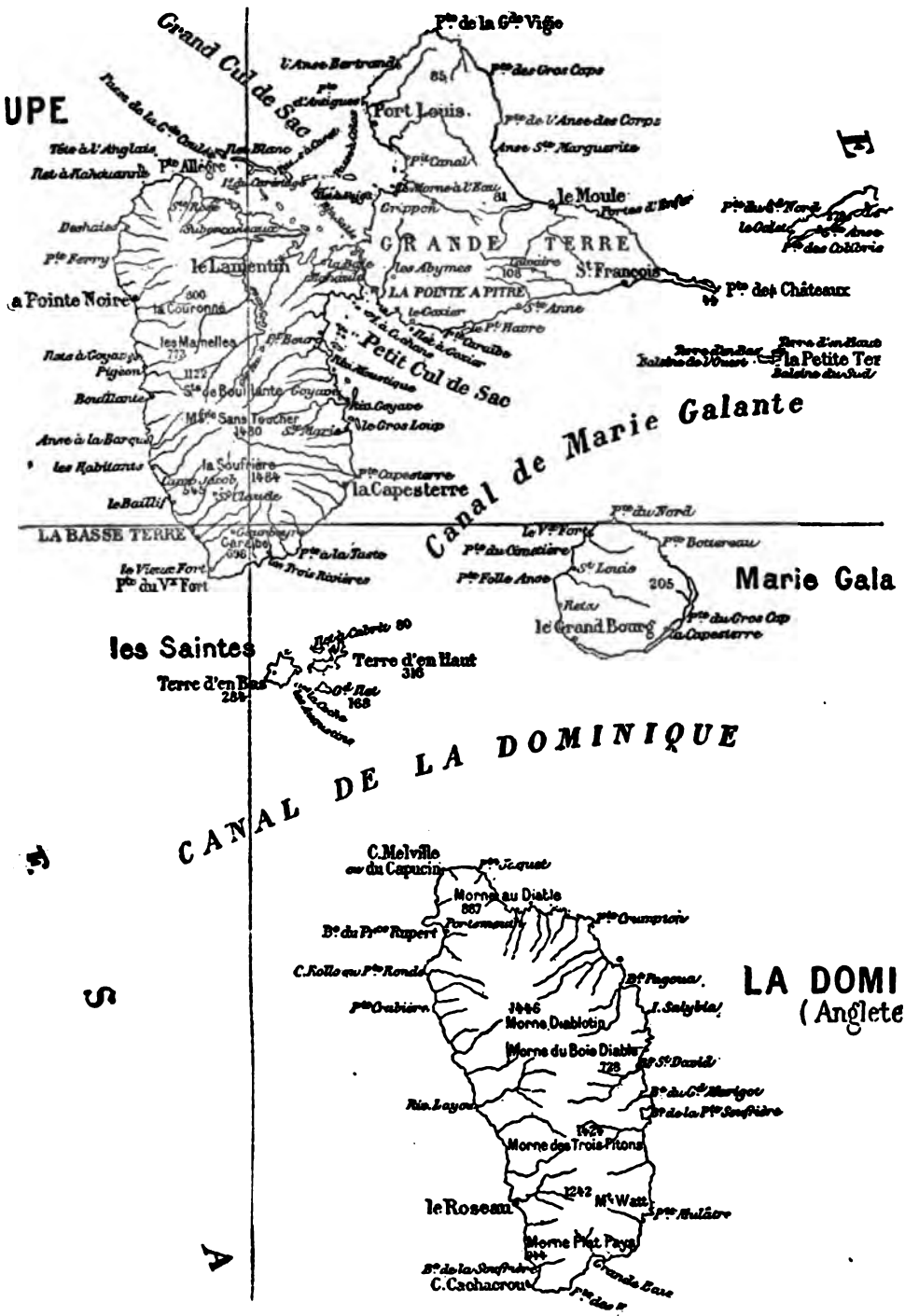

GUADALOUPE, MARIE GALANTE, AND DOMINICA.

[From Henrique's *Les Colonies Françoises*, Paris, 1889.]

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in their houses everything that could be gnawed had already been gnawed, so that nothing else remained of them but what was too hard to be eaten. In one of the houses we entered we found the neck of a man undergoing the process of cooking in a pot, preparatory for eating it.[15]

"The habits of these Caribbees are beastly.

"There are three islands: this one, on which we are, is called by the natives Turuqueira;[16] the other, which was the first we saw, is named Cayre;[17] and the third, Ayay.[18] There is a general resemblance among the natives of these three islands, as if they were of the same lineage. They do no harm to one another, but each and all of them wage war against the inhabitants of other neighboring islands, and for this purpose sometimes they go as far as 150 leagues in their canoes,[19] which are a narrow kind of boats, each made out of a single trunk of a tree. Their arms are arrows, in place of iron weapons, and as they have no iron, some of them point their arrows with a sharpened piece of tor-

[15]Mr. Justin Winsor, the accomplished librarian of Harvard College, in his "Christopher Columbus," referring to the Caribbee Indians, makes the following interesting remarks: "The contiguity of these two races, the fierce Carib and the timid tribes of the more northern islands (the Lucayans), has long puzzled the ethnologist. Irving indulged in some rambling notions of the origin of the Carib, derived from observations of the early students of the obscure relations of the American peoples. Larger inquiries and more scientific observations since Irving's time have been given to the subject, still without bringing the question to recognizable bearings. The craniology of the Caribs is scantily known, and there is much yet to be divulged. The race in its purity has long been extinct. Lucien de Rosny, in an anthropological study of the Antilles published by the French Society of Ethnology in 1886, has amassed considerable data for future deductions."

[16]This was the island of Guadeloupe, named by Columbus *Nuestra Senora de la Guadalupe* in remembrance of the famous sanctuary of Our Lady of Guadeloupe, in the province of Extremadura, Spain.

[17]This was the island of Dominica, so called by Columbus from having been discovered on a Sunday (*Dies Dominica*). It is 29 miles long and 13 miles in its greatest breadth, situated at 15° 25 min. North latitude, and 61° 15 min. West from Greenwich Observatory, in England. It has an area of 291 square miles and belongs to England.

[18]This must have been the island now known as Martinique, though Dr. Chanca does not mention in his letter having been there. It is situated 30 miles south by west of the island of Dominica, and 20 miles north from the island of St. Lucia.

[19]That is to say, 450 Spanish miles, or about 376 English miles, which means as far as Porto Rico, Santo Domingo and Cuba to the north, and Trinidad, Curacao and the coast of South America to the south.

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toise-shell, and others make their arrow heads of fish spines, which are naturally barbed like coarse saws. These arms are dangerous weapons only to naked people like the Indians, causing death or severe injury, but to men of our nation they are not much to be feared.[20] . . .

"When the Caribees take any boys as prisoners of war, they cut off their male organs, fatten them until they grow up to manhood, and then, when they wish to make a great feast, they kill and eat them up, for they say the flesh of boys and women is not good to eat. Three of those boys thus mutilated came fleeing to us when we visited the houses.[21]

"The difference between these Caribbees and the other Indians, with respect to dress, consists in wearing the hair very long, while the others have it clipped irregularly; also because they engrave in their heads innumerable cross-like marks and different devices, each according to his fancy; and they make those marks with sharpened bamboo sticks. All of them, both the Caribbee and the other Indians, are beardless, so that it is a marvellous thing to find one of these men with a beard. The Caribbees, whom we have taken prisoners, have their eyes and

[20]Dr. Chanca did not know at that date that the arrow points of the Caribbees were poisoned with the juice of a plant, probably the inspissated sap of the manchineel tree.

[21]Herr Alexander von Humboldt, in his "Personal Narrative of Travels to the Equinoctial Regions of America," speaking about the Caribbees, makes the following instructive observations: "Reproaches addressed to the natives on the abominable practice which we here discuss, produce no effect; it is as if a Brahmin, traveling in Europe, were to reproach us with the habit of feeding on the flesh of animals. In the eyes of the Indian of the Guaisia, the Chernvichæna was a being entirely different from himself, and one whom he thought it was no more unjust to kill than the jaguars of the forest. It was merely from a sense of propriety that, while he remained in the mission, he would eat only the same food as the Fathers. The natives, if they return to their tribe (*irse at monte*), or find themselves pressed by hunger, soon resume their old habits of anthropophagy. And why should we be so much astonished at this inconstancy in the tribes of the Orinoco, when we are reminded, by terrible and well-ascertained examples, of what has passed among civilized nations in times of great scarcity? In Egypt, in the thirteenth century, the habit of eating human flesh pervaded all classes of society; extraordinary snares were spread for physicians in particular. They were called to attend persons who pretended to be sick, but who were only hungry; and it was not in order to be consulted, but devoured. An historian of great veracity, Abd-allatif, has related how a practice, which at first inspired dread and horror, soon occasioned not the slightest surprise."

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eyebrows stained circularly around, which I think they do for ostentation, and also because it gives them a ferocious appearance. . . .

"Here almost terminate the group of islands which, on the side toward Spain, had not been seen before by the Admiral,[22] although we regard as a matter of certainty that there is land more than forty leagues beyond the southernmost of these newly-discovered islands.[23] We believe this to be the case, because two days before we saw the first island[24] we had observed some birds, called 'rabihorcados,' which are marine birds of prey that do not sit nor sleep on the water, making circumvolutions high up in the air at the close of the evening, with the object of taking their reckoning of where they are and flying after that in a straight line towards land to sleep.[25] These birds could not have been going to spend the night at more than twelve or fifteen leagues' distance from where they were, because it was already late in the evening, and the direction they took in their flight was toward the south. From all this we concluded there was land in that direction still undiscovered; but we did not go in search of it because it would have taken us out of our intended route. I hope that in a few more voyages it will be discovered.[26]

"The country is very remarkable, and contains a vast number of large rivers and extensive chains of mountains, with broad, open valleys, and the mountains are very high. It does not look as if the grass is ever cut throughout the whole year. I do not

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[22]Dr. Chanca refers here to the island called by the aborigines *Borinquen,* which is the island we know to-day as Porto Rico, and named by Columbus "San Juan Bautista" (*St. John the Baptist*). The date of its discovery was Saturday, November 16, 1493. There ended the Caribbee islands, the first account of whose fierce and savage inhabitants was received with eager curiosity by the learned of Europe.

[23]It is truly admirable how nearly exact was this calculation of Dr. Chanca, for the comparatively large island of Trinidad, and the north coast of Venezuela, are about that distance from Martinique, the southernmost of those just discovered islands.

[24]The island of Dominica.

[25]They were frigate or man-o'-war birds (*Tachypetes aquila*), a peculiarity of which is that they persecute and compel the much larger marine birds, common pelicans (*Pelicanus onocrotalus*), to throw up what they have swallowed, and eat it themselves.

[26]And that land was in fact discovered, as predicted by the learned author of this overlooked important historical document, in the very next voyage of Columbus. On July 31, 1498, he discovered the island of Trinidad and caught a glimpse of *terra firma* at the delta of the Orinoco river.

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think that they have any winter here, for at Christmas we found many bird-nests, some containing the young birds and the others the egg. No four-footed animal has ever been seen in this, nor in any of the other islands, except some dogs of various colors, as in our country, but in shape and size like lap-dogs.[27] Of wild, ferocious beasts, there are none.[28]

"I came near forgetting to mention another four-footed little animal, in the color of its hair, size and fur, like a rabbit, but with long tail and feet similar to those of a rat.[29] These animals climb up the trees,[30] and many of our men who have eaten them say their taste is very good.

"There are many snakes, small in size, also lizards, but not so many, for the Indians consider them as great a luxury as we do pheasants. These lizards are of the same size as ours, but different in shape.

"In a small adjacent island, close by a harbor which we named Monte Cristo, where we stayed several days,[31] our men saw an enoromus kind of lizard, which they said was as large around the body as a calf, and the tail shaped like a lance.[32] They often went out to kill it, but bulky as it was it disappeared in the thicket and got into the sea, so that they could not catch it. . . .

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[27]These "lap-dogs" (*goxques*), so-called by Dr. Chanca, which did not bark, were the animals known to the Lucayan Indians by the name of *quemi*, one of the very few quadrupeds found in the Antilles, and, in my opinion, no other than the indigenous raccoon of Florida (*Procyon lotor*), now completely extinct in those islands.

[28]The cayman and the crocodile are the most dangerous animals found, and yet they never attack people unless compelled to defend themselves. Of the very many varieties of snakes found, and still existing there, none of them is poisonous.

[29]This little animal is the *hutía* or *jutía*, as it is called in Spanish after its Indian name, a sort of mountain rat still plentiful in those islands. There are two distinct varieties: one, large in size, called *jutía conga* (*Capromys Fournieri*), and the other, small in size, named *jutía carabal* (*Capromys Poeyi*). They are strictly herbivorous.

[30]The present poor country people of those islands roast and eat them the same as little pigs, and their taste is really good. During the recent struggle for independence in Cuba, the patriot soldiers were compelled, on account of the scarcity and poor quality of their armament, together with lack of ammunitions of war, to live in the woods, and there they killed almost all the jutías to provide themselves with food.

[31]This small island is called now Cabras or Goat Island.

[32]This big kind of lizard was nothing else but an alligator, which is the corrupted English word from the Spanish *el lagarto* (*Alligator lucius*).

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"There are, both in this and in the other islands, an infinite number of birds like those we have in our country, and many others, such as we had never seen. No kind of domestic fowl has been found here, with the exception of some ducks in the houses of the island Turuqueira. Those ducks were in size larger than the ones we have in Spain, though smaller than geese, very pretty, with flat crest, and most of them as white as snow, but some also black. . . .

"Fish is abundant here, an article of food of which we were in great need, for our provision of meat was running short, and it is a singular kind of fish, more wholesome than those we have in Spain. The climate does not allow the fish to be kept from one day to another, for all animal food speedily becomes unwholesome on account of the great heat and dampness. . . .

"Large quantities of vegetables have been planted, and they certainly attain a more luxuriant growth in eight days here than they would attain in Spain in twenty.

"We are frequently visited here by great number of Indians, accompanied by their *caciques,* who are their captains or chiefs, and many women. They all come loaded with *ages*, a sort of turnip, very excellent food, which they cook and prepare in various ways. This food is very nutritious, and has proved of the greatest benefit to us all after the privations we endured when at sea, which in truth were more severe than man ever suffered. .

"The little time that we have spent on land has been so much occupied in seeking a place to establish the settlement,[33] and in providing ourselves with things we needed,[34] that we have had

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[33]They found at last a convenient place, in the selection of which the professional advice of Dr. Chanca was duly consulted. It was on the shore of a good bay on the north coast, on high ground, with two rivers of potable water near by, and the back part well closed by the thick growth of an impassible forest that protected it from being set on fire by the Indians on a night attack. *There,* in that spot was immediately commenced the building up of the very first Christian town of the New World, to which Columbus gave the appropriate name of Isabella, his great protectress. The ruins of the stone buildings in a solitary waste constitute to-day the melancholy relic of that historical locality.

[34]The principal of those things needed were fresh vegetables and fish, and the expeditionists soon got them. The vegetable gardens planted were speedily clothed in green, producing plentifully onions and pumpkins, radishes and beets. Sugar-cane, the first ever planted in American soil, and brought by those colonizers from the Canary Islands, had also been sown, and came up splendidly.

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little opportunity of becoming acquainted with the natural productions of the soil. In spite of this drawback, we have already seen many marvellous things. For instance: trees bearing wool, of a sufficiently fine quality (according to those who are acquainted with that industrial art) to be woven into good cloth.[35] And of this kind of tree there are so many, that we might load our vessels with wool, though it is somewhat difficult to gather it because these trees are very thorny, but some means can easily be found to overcome that difficulty.

"There are also cotton trees, as large as peach trees, which all the year round produce cotton, and in abundance.[36]

"We found trees which produce wax, as good both in color and smell as bees-wax, and equally useful for burning; indeed, with very little difference between the one and the other.[37]

"There is a vast number of trees which yield surprisingly fine turpentine.[38] Tar is found in abundance, of very good quality, too.[39]

"We discovered trees which, in my opinion, bear nutmegs, but at present without fruit on them, and I say so because the bark tastes and smells like nutmegs.[40]

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[35]The tree to which reference is made here is called *ceiba* in Spanish, *pojot* in the French West India Islands, and "five-leaved silk-cotton-tree" in English (*Bombax ceiba*, Lin.). It grows to an immense size, is beautiful in appearance, and has its seeds enveloped in a cottony substance, light as feather, which fly in the air to a great distance.

[36]Probably the species known now as Sea Island cotton, still to be found wild in some localities in Cuba, Porto Rico and Santo Domingo. All varieties of *Gossypium* require a dry and sandy soil, and generally the plant flourishes most luxuriantly near the seacoast.

[37]This tree is the wax-palm (*Ceroxylon andicola*), the stem of which is covered with a secretion consisting of two-thirds resin and one-third wax.

[38]One of those trees, besides the many varieties of pine-trees (genus *Pinus*), was called by the native Indians *hóbo* or *jóbo* (*Spondias lutea* or *Décandrie pentagynie*), which is the "mombain" with yellow fruit of the French botanists, a bulky tree belonging to the *Terebinthinaceæ* family, very abundant in the Antilles and resembling somewhat the cedar.

[39]More correctly asphalt or mineral pitch, of which there are several lakes in the Antilles, notably the one in the island of Trinidad, about three miles in circumference and located 138 feet above sea-level, near the village called La Brea.

[40]A species of *Myristica*, but certainly not the *Myristica moschata* of the Molucca Islands. Probably it was the tree called by the aborigines *caumaná* whose leaves have a smell like that of fennel, the bark a sweet taste, and in general appearance resembles the nutmeg tree.

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"I saw one root of ginger, which an Indian was carrying around his neck.[41]

"There is aloes, too, though not of the same kind as the one we are acquainted with in Spain, but, nevertheless, a species of aloes that we doctors use.[42] A sort of cinnamon has likewise been found, but, to speak truthfully, it is not of such a fine quality as the one we have in Spain; or, perhaps, this is so because now it is not the proper season to gather it, or the soil in which it was found growing in this vicinity is not well adapted.[43]

"We have also seen here some yellow mirabolans.[44] At this season they are lying under the trees, and as the ground is very damp they are all rotten, and have a very bitter taste, due, in my opinion, to their state of decomposition; but the flavor of those parts which in spite of that have remained sound, is the same as that of the genuine mirabolan. There is, besides, very good kind of mastic.[45] . . .

"In our present position, we are in the neighborhood of many mines of gold, not any one of which, we are told, is more than twenty or twenty-five leagues off. The Indians say that some of them are in Niti, a place in the possession of Caonabó, that Indian king who killed the Christians;[46] other mines are located in another place called Cibao, which, if it please God, we shall see with our own eyes before many days have passed; indeed, we should go there at once were it not because we have so many things to attend to that there are not enough men among us to do it at present. And this is in consequence of one-third of our people having fallen sick within four or five days after we landed here, which misfortune, I think, has happened principally on account of the toil and privations of the journey, to which must

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[41]Truly, this must have been the dry, wrinkled rhizome of the ginger-plant (*Zinziber officinalis*), so well known in Jamaica.

[42]The species called Barbados aloes (*Aloes hepatica*), which is still considered of an inferior quality to *Aloes socotrina.*

[43]That was probably the wild American cinnamon (*Neetandra cinnamomoides*), or perhaps the white cinnamon of Winter (*Canella alba*).

[44]They most likely were the fruit of the *Myrabolanus citrino* of Gartner, or the fruit called in Spanish *icaco* (*Chrysobalanus icaco*).

[45]A valuable resin exuding from the mastic-tree (*Pistacia lenticus*).

[46]This Indian chief was a Caribbee by birth and ruled over the province of Hispaniola, called by the natives *Mangana,* in which were the mountains named Cibao. He was the cacique who killed the 38 men left by Columbus in that island on his return to Spain from his first voyage of discovery to America.

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be added the variableness of the climate;[47] but I trust in our Lord to be able to restore all the sick to health.[48]

"None of the natives of all these islands we have visited possess any iron. They have, however, many implements, also hatchets and axes, all made of stone, which are so handsome and well finished that it is a wonder how they can contrive to make them without employing iron. . . .

"Their principal food consists of a sort of bread made of the root of an herb, half way between a tree and grass,[49] and the *age,* which I have already described as being like the turnip, and a very good food it certainly is.[50] They use, to season it, a vegetable called *agí,*[51] which they also employ to give a sharp taste to the fish and such birds as they can manage to catch, of the infinite variety there are in this island; dishes, all of them, that they prepare in different ways. They have, besides, a kind of grain, in appearance like hazelnuts, very good to eat.[52] They eat all the snakes, lizards, spiders and worms that they find on the ground, so that, according to my judgment, their bestiality is greater than that of any beast on the face of the earth. . . .

[47]The climate changes suddenly in those West India Islands from being very hot and dry to comparatively cool and very damp, due to long-continued and heavy rain.

[48]Columbus himself was also sick with malarial fever for a few days, and seven months later suffered a dangerous malady, which I have ventured to diagnose as typhus or "ship fever" in my monograph on "The Medical History of Christopher Columbus." (*J. Am. M. Assoc.,* May 5, 1894; *also, Dublin J. M. Sci.,* Aug-Sept., 1894.)

[49]I think Dr. Chanca alludes here to the maize, or Indian corn (*Zea mays*), of which the aborigines of Hayti made a kind of bread.

[50]This farinaceous root is the *yuca,* called in English yucca or Adam's needle, also known as Barbados nut, a fibrous tuber, very esculent, of which there are in the West Indies two well-known kinds, the sweet (*Yucca gloriosa*) and the bitter (*Yucca filamentosa*), this last one being cathartic and somewhat poisonous. It contains a large quantity of starch, which is obtained from the juice of the grated yucca, and from the fibrous residue is prepared the *casabe* or cassava (a corruption of the Spanish word) in the shape of very large, round and thin sort of crackers, called in Spanish *tortas de casabe.* This kind of Indian bread is still made in Cuba, Porto Rico, Santo Domingo, etc., and is very much relished.

[51]Red pepper, (*Capsicum frutescens*) called *chili* in Mexico.

[52]It was not a grain at all, but the *palmiche* (in Spanish), which is the small nut of the royal palm-tree, growing in bunches like the fruit of the date-palm. It is very much used in Cuba, Porto Rico, Santo Domingo and the other West India Islands to fatten pigs with. Very likely the Indians ate it as food, and from that fact Dr. Chanca got his notion of its being a grain. Really, the nut looks like a small, green hazel-nut or *avellana.*

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"The Admiral had, at one time, determined to leave the search for the mines until he had first dispatched the ships that were to return to Spain, on account of the great sickness which had prevailed among our men;[53] but afterward he resolved to send two detachments under the command of two captains, one to Cibao,[54] and the other to Niti,[55] places where, as I have already stated, Caonabó lived and ruled. These two detachments in effect departed, and one of them returned on the twentieth of the month, while the other did so on the following day. The party that went to Cibao saw gold in so many places that one scarcely dares to state the fact, for, in truth, they found it in more than fifty brooks and rivers, as well as on their banks; so that the captain said that anybody who wished to seek for gold throughout that province would be sure to find as much as he wanted. He brought with him specimens from the different localities, that is to say, from the sand of the rivers and their banks.[56]

"It is generally believed that by digging as we know how, the gold will be found in greater compact masses, for the Indians neither know how to dig nor have they the means of digging the ground more than to a hand's depth.

The other captain, who went to the place called Niti, returned likewise with news of a great quantity of gold found in three

[53]The expeditionists in great numbers were suffering from malarial fevers (which they called *ceciones,* meaning by that word alternating chills and fever), about one-third of them, as Dr. Chanca states, being ill. That disease in those days was very little known, and much less its prevention and treatment. The miraculous *pulvis febrifugus orbis Americani,* also called then by the names of "The Jesuits' Powders" and The Countess's Powders" (*los polvos de la condesa,* alluding thereby to the Spanish Countess of Chinchon, the wife of the Viceroy of Peru, who was the first European to be cured with that new remedy), was not yet known to Europeans. The existence and the wonderfully curative virtue of the mysterious "quinquina" (a corruption of the indigenous Peruvian word *kina-kina,* which signifies "the bark *par excellence*") was at that time known only to the aborigines of the then undiscovered kingdom of Peru. And, in truth, it was not until the year 1738 that, thanks to the valuable investigations of the French scientist La Condamine, the tree that produces this most precious bark was known with certainty. He, too, was the first scientist to conceive and carry out the idea of transporting and transplanting that tree to other countries than the one of its natural habitat.

[54]In the Lucayan language that word meant "stone mountain."

[55]The fertile valley later called by the Spaniards *La vega real.*

[56]One of those specimens of gold was a nugget that weighed 9 ounces.

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or four localities, of which he also brought some specimens with him.[57]

Thus, surely, the King and Queen may henceforth regard themselves as the most prosperous and wealthy sovereigns on earth, because never yet, since the creation of this world, has such a thing been seen or read of. On the return of the ships on the next voyage, they certainly will be able to carry back such a quantity of gold as will fill with amazement all who hear of it.

"Here I think I shall do well to break off my narrative. And I believe that those who do not know me, and hear of these things that I relate to you, may consider me prolix and somewhat an exaggerator, but God is witness that I have not exceeded by one iota the bounds of truth."

THE SUPPOSED WARFARE BETWEEN MEDICAL SCIENCE AND THEOLOGY.

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OF course, it is evident to anyone who knows President Andrew D. White's work, "A History of the Warfare of Science with Theology in Christendom," that when I answered Dr. Cruikshank's article on "Some Relations of the Church to Scientific Progress," which appeared in the Medical Library and Historical Journal for July, 1905, I was directly contradicting practically everything that President White has to say in his book with regard to the supposed warfare between medical science and theology. On a number of occasions previously, in writing articles on phases of the history of medicine, I had taken occasion to point out certain palpable errors in medical

[57]Those specimens of gold from the valley called Niti were fewer in number and of less value than the ones brought out from the mountains of Cibao. The captains of those two small detachments of Spanish soldiers were two brave young hidalgos, one named Alonso de Ojeda, who started with only fifteen soldiers, and the other, Ginés de Gorbalán, who was sent back to Spain by Columbus right after his return from this expedition to Niti, as a witness of the marvelous richness of Hispaniola. He took away with him to Spain the large nugget of gold weighing 9 ounces.

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history which President White had made. It is, therefore, with no little gratification that I find that President White takes up the defense of what he has written, since now there can be a definite settling of certain vexed questions, which his prestige has made many physicians accept, though they could not find authority for them in the ordinary histories of medicine.

In all this discussion which has resulted from Dr. Cruikshank's many assertions, there are just two questions that are of interest to students of medical history. These two questions are, Did the Popes forbid dissection, or was some papal decree falsely interpreted, so as to be considered to prohibit dissection? and, Did the Popes forbid chemistry or the science that preceded chemistry, or was some papal decree taken to mean that the investigation of chemical or alchemical problems was forbidden? Here are very direct issues in two subjects that are of the greatest importance in medical history, and President White has written with great emphasis that both, anatomical investigation and chemical investigation, were prohibited. He says in his "Warfare of Science" that "anatomical investigation was considered a sin against the Holy Ghost," and that the bull of John XXII, *Spondent pariter*, "dealt a terrible blow at the beginnings of chemical science."

Now I have written in previous articles that both of these assertions are false. I have said that the Decretal of Pope Boniface the VIII, which Dr. White admits did not directly forbid dissection, but was misinterpreted to express such a prohibition, had no effect at all upon the history of anatomy! that dissection can be traced in Italy during all the period in which, according to Dr. White, it was considered a sin against the Holy Ghost, and that authoritative modern writers on the history of anatomy, who mention the Decretal at all, deny that this Bull had any influence on anatomical studies. The Bull of John XXII did not "deal a terrible blow at the beginnings of chemical science," and though Dr. White says, "If you would know what, in the opinion of those who have studied the subject, was the effect of the Bull upon chemical research, turn to any of the standard historians of chemistry. I have but followed what I found their unanimous opinion." I find myself obliged, after another careful consultation of the authorities, to deny this and to say that the standard historians of chemistry are not unanimous in any such statement. In a word, while President White has a reputation as a professor of general history, he has apparently neglected the study of medical history, though his prestige is such, and he writes with such a

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confident assurance, that his assertions have been generally accepted by medical men.

President White says, in a letter incorporated in an article of Dr. Cruikshank in the March, 1906, number of the MEDICAL LIBRARY AND HISTORICAL JOURNAL: "He (Dr. Walsh) takes the Decretal of Boniface in 1300 and endeavors to show that so far from forbidding dissection, it had quite a different tenor, and that at sundry Universities in Italy and at the University of Montpellier in France dissection was admitted and most openly practised." "This," he adds, "seems to me very disingenuous."

Of course, I am sorry if Dr. White should deem it disingenuous. That is not a nice word to begin an historical discussion with. But I must insist there is no question of an *endeavor* to show that the Decretal did not forbid dissection and had quite a different tenor. The fact is perfectly plain to anyone who reads the Bull. In discussing this subject previously I gave only the title of the Decretal, with the Latin text in a foot-note; now, in order to show that there is no question of forbidding dissection, it seems advisable to give a careful translation of the full text of the document. This will preclude any possible misunderstanding and will set squarely before English-speaking students of medical history a decree that has been the subject of so much discussion, and the purport of which is so different from what it is said to be.

"Title Concerning Burials. Boniface VIII. Persons cutting up the bodies of the dead, barbariously boiling them, in order that the bones, being separated from the flesh, may be carried for burial into their own countries, are by the very act excommunicated.

"As there exists a certain abuse, which is characterized by the most abominable savagery, but which nevertheless some of the faithful have stupidly adopted, We, prompted by motives of humanity, have decreed that all further mangling of the human body, the very mention of which fills the soul with horror, should be henceforth abolished.

"The custom referred to is observed with regard to those who happen to be in any way distinguished by birth or position, who, when dying in foreign lands, have expressed a desire to be buried in their own country. The custom consists of disemboweling and dismembering the corpse, or chopping it into pieces, and then boiling it, so as to remove the flesh before sending the bones home to be buried—all from a distorted respect for the dead. Now, this is not only abominable in the sight of God, but extremely revolting under every human respect. Wishing, therefore, as the duty of our office demands, to provide a remedy for this abuse, by which the custom, which is such an abomination, so inhuman and so impious, may be eradicated and no longer be practised by others, We, by our apostolic authority, decree and ordain that no matter what position or family or dignity they may be, no matter in what cities or lands or

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places in which the worship of the Catholic faith flourishes, the practice of this or any similar abuse with regard to the bodies of the dead should cease forever, no longer be observed, and that the hands of the faithful should not be stained by such barbarities.

"And in order that the bodies of the dead should not be thus impiously and barbarously treated and then transported to the places in which, while alive, they had selected to be buried, let them be given sepulture for the time either in the city or the camp or in the place where they have died, or in some neighboring place, so that, when finally their bodies have been reduced to ashes or otherwise, they may be brought to the place where they wish to be buried and there be interred. And, if the executor or executors of the aforesaid defunct, or those of his household or any one else of whatever order, condition, state or grade he may be, even if he should be clothed with episcopal dignity, should presume to attempt anything against the tenor of this our statute and ordination, by inhumanly and barbarously treating the bodies of the dead, as we have described, let him know that by the very fact he incurs the sentence of excommunication from which he cannot obtain absolution (unless at the moment of death), except from the Holy See. And besides, the body that has been thus barbarously treated, shall be left without Christian burial. Let no one, therefore, etc. (Here follows the usual formula of condemnation for the violation of the prescriptions of a decree.) Given at the Lateran Palace, on the twelfth of the calends of March in the sixth year of our pontificate."

This, as readily may be seen, was a very wise measure from a hygienic standpoint. The Pope declares the custom revolting under every human aspect. All the modern world, even the most scientific, will agree with him.

It is very clear that nothing in this decree has anything to do with the practice of dissection. This is not—it seems—however, enough. President White continues: "The Decretal of Boniface was construed universally as prohibiting dissections for any purpose whatever, as may be easily seen in the Benedictine Histoire Litéraire de la France and other sources, Catholics as well as Protestant.

With regard to this it may be said at once that a literary history of France, written at the beginning of the nineteenth century, is a very curious place to find authority for a question in the history of anatomy in Italy at the beginning of the fourteenth century. Secondly, as President White ought to have known very well, the particular volume of the Histoire Litéraire de la France, in which this statement occurs, was not written by the Benedictines, but by a French literary man who has never been considered as having the slightest authority in the history of medicine. And thirdly, the decree was not construed as prohibiting dissections, except by

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some modern writers who wished to be able to urge this fact against the Popes. Haeser, for instance, a well-known German authority on the history of medicine, in his Text-book of the History of Medicine, Vol. I, p. 36, says that it is an error to think that Boniface's Bull *De Sepulturis* forbade dissection, since the practice was carried on without let or hindrance under ecclesiastical authorities, who universally presided over the universities of that day. Haeser quotes Corradi, who, in his sketch of anatomy in Italy during the Middle Ages, expressly denies that the bull of Boniface VIII hampered the progress of anatomical study or teaching in any way. That ought to settle the question forever.

I have mentioned Corradi all the more willingly, since Roth, Vesalius's biographer, confesses that it is from him that he (Roth) has taken the materials for his chapter on the history of dissection before Vesalius's time. President White frequently quotes Roth, and evidently considers him a reliable authority. Some of the details from this chapter of Versalius's great biography ought, then, to be quite sufficient to show even him that far from the Decretal of Boniface having been *universally* construed as prohibiting dissections, as President White says it was, it never entered the minds of medieval anatomists to consider it as having any such signification. Roth says: "In the pre-Vesalian period the dissection of the human body was practised, according to the terms of Frederick's law, for the instruction of those about to become physicians and surgeons. The natural place for this school anatomy—for a dissection was called *anatomia* or, erroneously, *anatomia publica*—was the universities and the medical schools. Apart from teaching institutions, however, public anatomies were held in Strasburg and in Venice. Their purpose was the instruction of the practising medical personnel of these towns. Dissections, which were not made for general instruction, were called private anatomies. They were performed for the benefit of a few physicians, or students, or magistrates, or artists. *Private anatomies* began to have special importance only towards the end of the pre-Vesalian period (this would be about the end of the fifteenth and the first quarter of the sixteenth century). It is a play of chance that the oldest historical reference to a dissection concerns a private anatomy, one undertaken for the purpose of taking a legal autopsy. This was made in Bologna in the year 1302 (two years after the Decretal supposed to forbid dissection). A certain Azzelino died with unexpected suddenness, after his physicians had visited him once. A magistrate suspected poi-

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son and commissioned two physicians and three surgeons to determine the cause of death. It was found that death had resulted from natural causes." (It would appear that this was not an unusual procedure, for, unless medical autopsies had been done before, it does not seem probable that this method of determining the cause of death would have been so readily taken up).

"Thirteen years later there is an account of the dissection of two female bodies in January and March of the year 1315, performed by Mundinus." (The fact that the two female bodies should be mentioned has been taken by most historians of medicine to indicate that Mundinus had very probably made many dissections of male bodies, as his text-book of anatomy seems to show, but that these two dissections of females had appealed to the chroniclers as worthy of special note.) "A few years later (1319) there is a remarkable document which tells the story of body snatching for dissecting purposes." (This would seem to be sufficient of itself to show that a number of dissections were being done, and, indeed, Rashdall, in his "History of the Universities," says that according to the university statutes teachers were bound to dissect such bodies as students brought to them.) Roth concludes that "these are a few, but weighty testimonies for the zeal with which Bologna pursued anatomy in the fourteenth century." (I may add that all of these concern the twenty years immediately following Boniface's Decretal.)

Nor was the custom of making dissections any less active during the rest of the half-century after the time that, if we are to believe President White, the decree of Boniface had been interpreted to forbid it. In the note to his history of dissection during this period in Bologna Roth says: "Without doubt the passage in Guy de Chaulliac, which tells of having frequently (*multoties*, many times, is the exact word) seen dissections, must be considered as referring to Bologna." This passage runs as follows: "My master, Bertruccius, conducted the dissection *very often* after the following manner: The dead body having been placed upon a bench, he used to make four lessons on it. In the first, the nutritional portions were treated, because they are so likely to become putrified. In the second, he demonstrated the spiritual members; in the third, the animate members; in the fourth, the extremities." (Guy de Chaulliac was at Bologna studying under Bertruccius just before the middle of the fourteenth century. It is evident, beyond all doubt, from what he says, that dissections were quite common. This is during the first fifty years after the

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decree. I have shown in my previous article that there are records of dissection during the second half of this century. Roth, however, goes on to tell next of the fifteenth century.)

He says: "For the fifteenth century the university statutes of the year 1405 furnish many sources of information. There is a special division which is concerned with the annual anatomy or dissection that had to be made and the selection of the persons to be present, the payment of the expenses and other details. An addition to the statutes, made in the year 1442, determines the arrangement of the delivery of the body from the city to the university authorities. Every year two bodies, one male and one female, must be provided for the medical-school dissection. In default of a female body, a second male body has to be provided. In the presence of such detailed regulations, the absence almost entirely of details as to the actual performance of dissections can mean very little. Bologna reached its highest development as a medical school at the beginning of the sixteenth century, when Alexander Achillinus and Jacob Berengarius had charge of the public dissections there. Of these I shall speak later." (It is clear that President White's notion that Vesalius was allowed to dissect at Padua, because this was Venetian territory, and Venice was constantly in opposition to the Popes, has no foundation in the history of anatomy, since Roth considers that Bologna occupies a more prominent place than Padua.)

Roth continues: "Padua had, like Bologna, dissection in the fourteenth century. There is the record of a dissection made in the year 1341, in which Gentilis made the discovery of a gallstone." (It is evidently not because the dissection was unusual, but because the discovery was unusual that this incident is mentioned. The dissections were such ordinary occurrences as not to deserve special mention, except for some particular reason.)

"Much more is known about dissection at Padua in the fifteenth century, when the city had become Venetian." (It is significant to note that the previous occurrence was in pre-Venetian days, for President White insists that it was the Venetian authorities, in opposition to the Pope, who allowed dissection at Padua. Here is the rebuttal of any such theory.) "Bertapaglia, in his 'Surgery,' has the record of the dissection of a criminal made under the direction of Master Hugo De Senis, on the 8th of February, 1429. On the 4th of April, 1430, the dissection of a woman was made. In 1444 Professor Montagnana speaks of fourteen dissections, at which he had been present." (This

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would seem to indicate that dissections were quite common, and that the occasional records of them give no proper idea of their actual number.)

All this I have taken from Roth, who is acknowledged as an authority on the history of anatomy because of his life of Vesalius and because he is the principal historian of anatomy whom White quotes in his "Warfare of Science." Roth says nothing about the decree of Boniface VIII, nor of any possible effect that it had upon anatomy. The real historian, of course, does not mention things that have not happened. Roth confesses, as I have said, that he takes the material for his sketch of anatomy before Vesalius's time from Corradi. Corradi being an Italian, and knowing of the slander with regard to the papal decree, explicitly denies it. Surely, here is material enough to convince anyone that all that President White has said with regard to the supposed effect of the misinterpretation of Boniface's decree is without foundation in medical history. The history of dissection begins just after the date of the decree. Within twenty years after the bull was issued, dissection was practised to such an extent that body-snatching became so common that there were persecutions for it, and public dissections seem to have been held every year in the universities of Italy all during the fourteenth century.

For those who, as teachers of medicine, are especially interested in the question as to when the history of modern dissection begins, it may be worth while to note that personally I always call attention in lectures on this subject to the fact that the easiest way to remember the date of the beginning of human dissection is to recall the year of Boniface's Bull (1300) which is supposed to forbid it. We are not sure whether human dissection was done before this period or not. Most of the anatomical knowledge was probably founded on animal dissections, but immediately after this there is abundant evidence that human dissections were made. It forms a rather curious commentary on President White's declarations in the matter, but it is easy to find excellent authorities for this teaching.

The more recent historians of medicine either do not mention the Bull of Boniface VIII, or any possible relation it may have had to the science of anatomy, or else mention only to deny it. They all make it very clear that dissection was practised very generally during the fourteenth century in Italy, and Pagel, in the chapter on "Anatomy and Physiology" in Puschmann's *Handbuch der Geschichte der Medizin,* says that "the successors

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of Mondinus (fourteenth century anatomists just after Boniface's decree) were in a position, owing to the gradual enlightenment of the spirit of the time and the general realization of the importance of anatomy, as well as the protection of the authorities, to make *regular systematic dissections of the human body.*" President White himself, in a private letter to me, has quoted Von Toeply's "Studien in der Geschichte der Anatomie im Mittelalter"* as giving a history of dissection, which shows the frequency of the practice during the fourteenth and fifteenth centuries.

This, then, would seem to settle the question of any interference by the Popes with any phase of anatomical development. I shall be very glad if it does, for then a number of prejudices will disappear. It might be thought that this was merely an academic question, but nothing of this nature ever remains purely academic. Twice since there has been a question of opening the medical school at Fordham, intelligent physicians, men who are graduates of prominent Eastern colleges, have asked, "But will you dare to teach anatomy at Fordham? Is not dissection forbidden by the Church?" Of course, such men are ignorant that most of the greatest anatomists have been devoted adherents of the Roman Catholic faith. I need only mention such names as Vesalius, Columbus, Malpighi, Steno, Winslow, Morgagni, Müller, Laennec, Claude Bernard, Theodor Schwann; but there are many others.

I should not be surprised, however, if many of the medical students, who take their first two years at Ithaca, would still continue to harbor this erroneous notion with regard to the Church's opposition to dissection. Prominently displayed in the principal corridor of the medical building at Ithaca is a picture of Vesalius. It is Hamann's well-known portrait, which represents the great anatomist as lifting his eyes to the crucifix above him as he does his dissection, quite as Pasteur is said to have done in his laboratory. It is the pictorial representation of the summing up of Vesalius's character, which is given by Roth in his preface to the life of Vesalius, and which I am sure, therefore, President White will appreciate. Roth says: "Contemporaries have called him the divine. To us he seems in science, in art, and *in religion,* in word and deed, as a complete and perfectly harmonious man." But the inscription beneath this picture of

*Leipzig und Wien, 1898.

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Vesalius at Ithaca, with its emphatic assertion that Vesalius against much opposition practised dissection, will surely lead most students to consider that before Vesalius's time there was practically no dissection, and will impress upon them President White's emphatically expressed opinion that the reason for the absence of dissection before Vesalius's time was the opposition of the Church.

It was with regard to Vesalius that President White has insisted most on the awful ecclesiastical opposition that anatomists had to encounter in practising dissection. To read his paragraph in the "History of the Warfare of Science with Theology" one would feel sure that Vesalius was a wonderful hero in this matter, and that he practically risked death over and over again, in order to pursue his favorite practise of dissection in the study of anatomy. I would be the last one in the world to wish to minimize in any way Vesalius's merits. He was a genius, a great discoverer—above all, the inventor of a method of study that has been most fruitful in its results, and withal a devout Christian and a firm adherent of the Roman Catholic Church. He was not a hero in the matter of dissection, however, for there was no necessity for heroism. Dissection had been practised very assiduously before his time in all the universities of Italy, especially in Bologna, which was a papal city from the beginning of the sixteenth century, and also in Rome at the medical college of the Roman University under the very eye of the Popes.

In the light of this kuowledge read President White's paragraph with regard to Vesalius:

"From the outset Vesalius proved himself a master. In the search for real knowledge he *risked the most terrible dangers, and especially the charge of sacrilege, founded upon the teachings of the Church for ages.* As we have seen, even such men in the early Church as Tertullian and St. Augustine held anatomy in abhorrence, and the decretal of Pope Boniface VIII was *universally construed as forbidding all dissection, and as threatening excommunication against those practising it. Through this sacred conventionalism Vesalius broke without fear; despite ecclesiastical censure,* great opposition in his own profession and popular fury he studied his science by the only method that could give useful results. No peril daunted him. To secure material for his investigations, he haunted gibbets and charnel-

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houses, *braving the fires of the Inquisition* and the virus of the plague." (The italics are mine.)

It will be readily seen what a caricature of the life of Vesalius there is in this paragraph, if one compares it with the following paragraph taken from the "History of Anatomy," written by Professor Turner, the professor of anatomy in the University of Edinburgh. In his article in the first volume of the *Encyclopedia Britannica* Turner says with regard to Berenger, of Carpi, who was the professor of anatomy at Bologna thirty-five years before Vesalius's time, that, "In the annals of medicine Berenger's name will be remembered as one of the most zealous and eminent in cultivating the anatomy of the human body. It was long before the anatomists of the following age could boast of equalling him. His assiduity was indefatigable, and he declares that he *dissected above one hundred human bodies.*" This should be enough, it seems to me, to settle the question that anatomy was permitted very freely before Vesalius's time. Professor Turner's authority in such a matter is above all suspicion. He knew the history of anatomy.

If more evidence be needed, compare with President White's fantastic sketch of Vesalius the following sketch of his great contemporary, Columbus, to whose anatomical investigations we owe the discovery of the pulmonary circulation:

"The fame of Columbus as an anatomical teacher was exceedingly great and widespread. Students were attracted to the universities where he professed, from all quarters and in large numbers. He was an ardent student of his favorite science and was imbued with the genius and enthusiasm of an original investigator. He was not satisfied with the critical examination of mere structure, but extended his researches into the more subtle, difficult and important investigation of the physiological function. He has been most aptly styled the Claude Bernard of the sixteenth century. The work of Columbus is a masterpiece of method and purity of style, as well as on account of its richness in facts and observations. He spent over forty years in these studies and researches. *He dissected an extraordinary number of human bodies. It must have been an age of remarkable tolerance for scientific investigation, for in a single year he dissected no less than fourteen bodies.* He also entered the crypts and catacombs of ancient churches, where the bones of the dead had been preserved and had accumulated century after century, and there,

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with unwearied care, he handled and compared over a half million of human skulls."

This account was written by Dr. George Jackson Fisher in his "Historical and Bibliographical Notes" for the *Annals of Anatomy and Surgery* (Brooklyn, 1878-1880). All the material that Dr. Fisher used in his sketch is to be found in Roth's "Life of Vesalius," p. 256. Now, Columbus was a contemporary of Vesalius, and worked with him at Bologna. The years of their lives correspond almost exactly. When Vesalius left Padua to become the royal physician to Charles V, it was Columbus who succeeded him. Later he taught also at Pisa. Then, strange as it may seem for those who have put any faith in President White's excursions into medical science, he was invited to become Professor of Anatomy at the Papal University at Rome, and it was while there that he had as many as three hundred students present at his demonstrations in anatomy and *there* that he did fourteen dissections in one year. The pretense that there was any ecclesiastical objection to dissection becomes absolutely farcical when one compares the life of Vesalius sketched by President White with a motive, and the life of his contemporary and successor, Columbus, by an unbiased physician, whose only idea was to bring out the facts.

But this is not all. President White says that Vesalius dedicated his book to Charles V, because he no longer dared to oppose ecclesiastical persecution in Italy. He felt the need of a powerful protector. What a far-fetched reason this is when there is another and more natural reason right at hand for those who know Vesalius's antecedents. Vesalius's great-grandfather was physician to Mary of Burgundy, the wife of the German Emperor Maximilian I. His grandfather succeeded to this position. Vesalius's father was the physician and apothecary to Charles V for a while, and accompanied the Emperor in journeys and campaigns. What was more natural than that his son should dedicate his great work on anatomy to the Emperor? But such a simple, straightforward explanation does not suit President White's purpose. According to him, Vesallus dedicated his work to Charles V. to shield himself as far as possible, and after this gave up his anatomical studies in Italy to put himself under the protection of Charles V.

Vesalius's successor, Columbus, did not have to do any such thing. Instead, he went down to Rome, and under the protection of the Popes continued to carry on his anatomical work there.

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When Charles V died, however, according to President White, a new weapon was forged against Vesalius. Vesalius was charged with dissecting a living man. President White hints that "the forces of ecclesiasticism united against the innovators of anatomy, and either from direct persecution or from indirect influences Vesalius became a wanderer." Just what that means I do not know. President White does not say that he was exiled, though that idea is implied. There is a great deal of doubt about this charge of Vesalius having made an autopsy on a living person. Roth discusses various versions. The whole thing seems to be a trumped-up story; but supposing it true, would it not be only proper that a man who made an autopsy on a living person should be brought before the court? He certainly would in our day in any civilized country. Professor Foster, of the University of Cambridge in England, following the lead of President White in this matter, blames the Inquisition for instituting the prosecution. If this be true, then is the Inquisition seen to be a civil, not a religious, tribunal, since this was a plain case of homicide.

The fact of the matter seems to be that Vesalius, who had not been very well in the unsuitable climate of Madrid, made the trip to the Holy Land, partly for reasons of health, but partly also for the reasons of piety. While returning, he died. Vesalius had been born in Brabant, and Brabant was at that time one of the most faithful Catholic countries of Europe, and, in spite of his eminent attainments as a scientist, Vesalius never lost the early habits of piety, acquired when he was a boy at his mother's knee and maintained during his years of education at the University of Louvain.

Just the same sort of caricature that he has made of the career of Vesalius, President White has also made of the lives of Copernicus and of Basil Valentine. I wrote a sketch of Copernicus for the MEDICAL LIBRARY AND HISTORICAL JOURNAL some time ago, because the great astronomer was also a physician as well as a clergyman. President White hints at persecution, and has ever tried to make the beautiful epitaph that Copernicus in his humility chose for himself evidence of this. But there is no warrant for this in history. Of the details of Basil Valentine's life we know absolutely nothing. We know only that a monk, who was a genius, wrote a series of books, in which the foundations of pharmacological chemistry are laid, and we have the books. Because of the lack of knowledge, President White says, "So fearful was he of danger that his work was carefully con-

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cealed." "The Papal Bull *'Spondent Pariter'* led him to wait until after his death to make a revelation of truth, which during his lifetime might have cost him dear." All this, presented as serious history, is entirely imaginative. No one knows a single detail of Valentine's personal life. His books show us how faithful a son of the Church he was. That is absolutely all.

In the light of these comments read President White's paragraph of attempt at explanation for the existence of dissection:

"But Dr. Walsh elsewhere falls back on the fact that, shortly after the decree of Pope Boniface VIII, *which struck so severe a blow at dissection,* the Venetian Senate passed a decree ordaining that a dissection of the human body should be made every year in the city of Venice, and he leaves his readers to conclude that this effectually proves that dissection had not really been discouraged by the Pope. The very opposite conclusion would be deduced by anyone familiar with the relations between the Republic of Venice and the Papacy. These two powers were always struggling against each other; again and again the Venetian Republic, in maintaining its rights, braved the Papal interdicts. The fact that it allowed dissections, so far from proving that the Pope allowed them, would seem to prove that in this case, as in so many other cases, and especially in that of Vesalius at Padua, the Venetian Republic sought to show the Vatican that it would yield none of its rights to clerical control. This very fact—that Venice refused to be bound as regards anatomical investigation by an order from the Vatican—seems to be entirely in the line of all other facts in the case, which show that the Roman Court had committed itself most unfortunately against the main means of progress in anatomy and medicine."

Here is the last stand reached by a really marvellous *tour d'esprit.* It was Venice defying the Vatican that permitted dissection. But there were dissections at Padua before it became Venetian territory. Bologna was always the leader in dissection, especially after it became a papal city. Rome was the center of anatomical interest in Columbus's time. Vesalius taught and demonstrated not at Padua alone, but also at Bologna and at Pisa. The recourse to Venetian opposition to the papacy as an explanation of dissection in spite of ecclesistical authority is only a subterfuge. Roth says there was more dissection at Florence, which is usually left unmentioned in the history of anatomy, than at Venice.

President White has simply been assisting at the creation of

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one of those myths that so often find their way into history in all departments, because men take things on second-hand authorities and do not look up the sources of information. The "Literary History of France" declared that the decree, issued by Pope Boniface, interfered somewhat with the development of anatomy, because it was taken to prohibit dissection. Some subsequent writer may have asserted that anatomical study was seriously hampered by it. By the time it had filtered into President White's book, "all anatomical investigation of the human frame was a sin against the Holy Ghost." When President White wrote in answer to my article, he was ready to assert that "the decretal of Boniface was constructed *universally* as prohibiting dissection for any purpose whatever, as may be easily seen in the 'Benedictine Histoire Litéraire de la France' and other sources, Catholic as well as Protestant." Myth making is sometimes supposed to be the exclusive property of religious fanatics; it is evident however, that it can also invade the domain of science, even when supposed science is arraigning theology and religion. I know that President White is interested in myths.

Now as to the question of chemistry, which is a simpler matter. With regard to the Bull of John XXII, President White says: "Dr. Walsh has, indeed, correctly printed it, and I notice no flaw in his translation." For this much I am under deep obligations. I am especially glad that he finds the translations correct. He has had much to say in the course of his answer about Jesuits and Jesuit schools, though what they had to do with the question of the history of medicine is a little hard to understand. Whatever he did say was derogatory. There is one thing that they do teach us well at Jesuit schools and that is Latin. I transfer the compliment then, if it was really implied, to my professors.

Then President White adds: "I have followed what I found to be the unanimous opinion of the standard historians of chemistry." By this Dr. White means, I suppose, that all the standard historians of chemistry declare that the Bull of John XXII forbade chemical investigation. Those who recall the Bull in question will remember that it begins with the words "Alchemies are forbidden." It proceeds to state at once, however, just what alchemies are forbidden. By alchemies the Pope declares that he means the pretended making of gold and silver by so-called alchemists who thus impose upon the people and debase the currency of the country. There is no reference, not even the most

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distant, to any phase of chemical investigation, yet President White says that this Bull forbade chemical investigation, and that the standard historians of chemistry *unanimously* (note the word) declare that it did so. I asked him by letter to name some of the historians of chemistry who made this declaration, but, though I received a courteous reply, it contained no names. I have consulted the standard historians of chemistry in German, English and French, and fail to find a single one of them who says any such thing. Kopp, the German historian of chemistry, mentions the fact that there was much less cultivation of chemistry during the fourteenth century than during the thirteenth, but makes no mention of the Bull of Pope John as being responsible for it. There are curious cycles of interest in particular departments of science, with intervals of comparative lack of interest that can only be explained by the diversion of the human mind to other departments of study. This seems to have happened with regard to chemistry in the fourteenth century.

Hoefer, the French historian of chemistry, mentions the fact that Pope John XXII took severe measures against the alchemists who then wandered throughout the country, seeking to enrich themselves at the expense of the credulity of the people. He evidently knew of this Bull then, but he says nothing about its forbidding or being misinterpreted, so as to seem to forbid chemical investigation. Thompson, the English historian of chemistry, has no mention of any break in the development of chemical science, caused by any action of the Popes, though, as I showed in my previous article, he devotes considerable space to the history of chemical investigation during the thirteenth and fourteenth centuries. Ernst von Meyer mentions the fact that alchemy was abused by charlatans, in order to make pretended gold and silver, and notes that there was not so much interest in chemistry in the fourteenth as in the thirteenth century, but does not ascribe this fact to the Bull of Pope John.

I expected at least that I should find something with regard to the question of the possible influence of the Bull in Berthelot's "History of Chemistry in the Middle Ages.* But though there are various historical topics treated that would seem to imply the necessity for saying something about the Bull, if it had any such effect as described, yet there is no mention of it. He mentions the Franciscan alchemists of northern Italy, who lived

* Berthelot's Histoire de la Chimie au Moyen Age. Paris, 1893.

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about this time, and discusses the "Rosarium," written very probably after the date of the Bull by a Franciscan monk, but there is no suggestion as to any hampering of alchemy by papal or other ecclesiastical restrictions.

The French Grande Encyclopédie does not mention it, nor does a German encyclopædia, also consulted. Even the Encyclopædia Britannica, in its article on alchemy, makes no mention of the prohibition of alchemy by Pope John XXII, and when the Encyclopædia Britannica does not mention any scandal with regard to the Popes, then the scandal in question must have an extremely slight or no foundation.

Now these are the standard historians of chemistry. These are the ones particularly mentioned as authorities by Venable, the professor of chemistry in the University of North Carolina, who also, by the way, in his short history of chemistry, makes no mention of this bull of the Pope as hampering chemical investigation. These are the important historians according to the Smithsonian list. These are the histories of chemistry that are to be found in Columbia University library, and Columbia rather prides herself on providing standard works for the consultation of her students. President White says that he has followed the unanimous opinion of the standard historians of chemistry. Every one of these histories should have it. Perhaps it is in them, but I could not find it. I shall be glad to know. Let us, by all means, have the names of the *standard historians of chemistry, who are unanimous* in their opinion that the Bull of John XXII put an end to all chemical investigations for centuries.

But President White, having admitted that it is not the bull of 1317 that was the cause, or at least that, if it were, it was on account of the misunderstanding of it, now shifts his ground and makes another bull of the same Pope, issued ten years later, the subject of his attack. His declarations with regard to this are so definite and uttered with so much assurance, that I was persuaded that the second bull at least must contain all that he said it did. Though I had a copy of it in the house, it seemed scarcely worth while looking it up, since it appeared reasonable to think that, after his experience in the misquotation of two other papal documents, there would surely be no attempt to cite a third without carefully consulting its contents. My surprise can scarcely be described, then, when I found that this third bull had been more completely misquoted, if possible, than any of the others. President White said:

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"It is a pity that Dr. Walsh does not quote in full Pope John's other and much more interesting bull—*super illius specula*—of 1326. One would suppose from the Doctor's account that this pontiff was a kindly and rational scholar seeking to save the people from the clutch of superstition. This bull of 1326 shows Pope John himself, in spite of his infallibility, sunk in superstition the most abject and debasing; for, in this bull, supposed to be inspired from wisdom from on high, Pope John complains that both he and his flock are in danger of their lives by the arts of the sorcerers. He declares that such sorcerers can shut up devils in mirrors, finger-rings and phials, and kill men and women by a magic word, that they had tried to kill him by piercing a waxen image of him with needles, in the name of the devil. He, therefore, not only in this bull, but in brief after brief, urged bishops, inquisitors and other authorities, sacred and secular, to hunt down the miscreants who thus afflicted the faithful, and he especially increased the power of the inquisitors in various parts of Europe, for this purpose. This bull it was, and others to the same purpose, which stimulated that childish fear and hatred against the investigation of nature which was felt for centuries and which caused chemistry to be known more and more as one of the 'seven devilish arts.' "

After this tirade against the bull and Pope John XXII why did not President White himself quote the bull? Since he leaves the task for me, I am only too glad to do it. Anyone who reads it will need no further defense of the character of Pope John XXII against the aspersions of those who pronounce judgment against him without ever having seen the documents on which their condemnation of him is founded. Anyone who will read the actual bull in question side by side with President White's utterly incomprehensible paragraph, will appreciate better than any words of mine can tell why it is that I, together with so many fellow-Catholics, have strenuously objected to the publication of statements, supposedly founded on papal documents, which either have no existence or are utterly misrepresented by the unfortunate historical tradition which insists in seeing nothing good in the ages immediately preceding the so-called Reformation, though they gave to us the foundation of everything worth while in our modern life. A translation of the bull in question follows:

TITLE: Against those sacrificing to demons or seeking replies or aid from them, or keeping in their possession books treating of errors of this kind.

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John, Bishop, Servant of the Servants of God, as a perpetual remembrance.

Seeking to discover how the sons of men know and serve God by the practice of the Christian religion, we look down from the watch-tower, where, though unworthy, we have been placed by the favoring clemency of Him who made the first man after His own image and likeness; setting him over earthly things; adorning him with heavenly virtues; recalling him when a wanderer, and bestowing on him the law; freeing him from slavery; finding him when he was lost; and finally ransoming him from captivity by the merit of His Passion. With grief we discover that there are many who are Christians only in name; many who turn away from the light which once was theirs, and allow their minds to be so clouded with the darkness of error as to enter into a league with death and a compact with hell. The very thought of it wrings our soul with anguish.

They sacrifice to demons and adore them, they make or cause to be made images, rings, mirrors, phials, or some such thing in which by the arts of magic evil spirits are to be enclosed. From them they seek and receive replies, and ask aid in satisfying their evil desires. For a foul purpose they submit to the foulest slavery. Alas! this deadly malady is increasing more than usual in the world, and inflicting greater and greater ravages on the flock of Christ.

SECTION I. Since, therefore, we are bound by the duty of our pastoral office to bring back to the fold of Christ the sheep who are wandering through devious ways and to exclude from the Lord's flock those who are diseased lest they should infect the rest. We, by this edict which in accordance with the Counsel of our brother bishops is to remain in perpetual vigor, warn all and in virtue of holy obedience and under pain of anathema enjoin on all those who have been regenerated in the waters of baptism not to inculcate or study any of the perverse teaching we have mentioned or what is more to be condemned practice them in any manner upon anyone.

SECTION II. And because it is just that those who by their deeds make mock of the most High should meet with punishment worthy of their transgressions we pronounce the sentence of excommunication which it is our will they shall *ipso facto* incur, who shall presume to act contrary to our salutary warnings and commands. And we firmly decree that in addition to the above penalties a process shall be begun before competent judges for the infliction of all and every penalty which heretics are subject to according to law, except confiscation of goods,* against such as being duly admonished of the foregoing or any of the foregoing practices, have not within eight days from the time when the admonition was given amended their lives in the aforesaid matters.

SECTION III. Moreover since it is proper that no opportunity or occasion should be given for such flagitious practices, we, in conformity with the advice of our brother bishops ordain and command that no one shall presume to have or to hold books or writings containing anything of the before mentioned errors or to make a study of them. On the contrary

*This exception is worth noting, especially since it is evidently Pope John's attempt to prevent abuses that might arise from the cupidity of judges.

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we desire and in virtue of holy obedience we impose the precept upon all that whoever shall have any of the aforesaid writings or books, shall within the space of eight days from their knowledge of our edict in this matter destroy and burn them and every part thereof absolutely and completely; otherwise, we decree that they incur the sentence of excommunication *ipso facto* and, when the evidence is clear, that other and greater penalties shall be inflicted upon culprits of this kind.

Now, here is a papal document that, far from containing any of the superstitions that President White so outspokenly declares it to contain, is a worthy expression of the fatherly feelings of the head of Christendom that might well have been made at any, even the most enlightened, period of the world's history. The two sentences on which all of President White's serious accusations are founded are simple expressions of the Pope's solicitude for his flock on hearing of some of the practices that they are said to give themselves up to. He does not say, even, that sorcerers can shut up devils in mirrors, finger-rings and phials, but uses the hypothetical expression that in these things by magic art evil spirits are to be enclosed. The bull has no reference at all to the killing of men and women by a magic word and as to where President White found that Pope John declares in this bull that sorcerers had tried to kill him by piercing a waxen image with needles in the name of the devil, it is impossible to understand. As I said before, Dr. White has been engaged in following a history myth, and this is further evidence in support of my statement.

In the light of this document what is any fair-minded man to think of the concluding sentences of President White's paragraph which I have already quoted? "He (John), therefore, not only in this bull, but in brief after brief, urged bishops, inquisitors and other authorities, sacred and secular, to hunt down the miscreants who thus afflicted the faithful, and he especially increased the power of the inquisitors in various parts of Europe, for this purpose. This bull, it was, and others to the same purpose, which stimulated that childish fear and hatred against the investigation of nature which was felt for centuries and which caused chemistry to be known more and more as one of the 'seven devilish arts.'"

This is a very easy way of apparently accumulating evidence, but this sort of thing has been allowed to pass unquestioned entirely too long. Each brief that is supposed to have the purport claimed for it must be quoted in full. If this is done the supposed opposition of the Popes to medical science will prove to be as entirely imaginary as the alleged opposition to anatomy and chemistry.

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Now it is only fair to devote a few words to the originator of this little discussion, Dr. Cruikshank. I think that the carelessly uttered words of his address will have brought about one very decided benefit. Hereafter we will hear no more of papal prohibitions of anatomy or chemistry, and medical history will be by that much nearer the truth.

Dr. Cruikshank's answer is a very interesting document, but it almost entirely evades the questions originally raised. He made a number of assertions as to the history of science, which he seems to forget now. It was these assertions that I so strenuously objected to, and I am going to recall them to him. In order to make it perfectly clear just what is to be thought of these assertions, I shall place in parallel columns some comments that are founded on serious authorities in the history of medicine and other sciences. These assertions constitute the kernel of the doctor's address; all the rest of it is rhetoric, very charming in its way, but not of special interest in a historical journal. It is because of these assertions that I said that there was no statement of Dr. Cruikshank that had a basis in historical truth.

Assertions of Dr. Cruikshank.	*The Facts.*
Pope John XXII was especially energetic in persecuting the chemists to the full extent of the papal power, and in the year 1317 issued a bull calling on all rulers, secular and ecclesiastical, to hunt down the miscreants.	The bull, as I showed in my previous paper, had no such meaning. There was no persecution of chemists or alchemists because of it, but Dr. Cruikshank makes no reference at all to this in his answer.
To attempt the study of chemistry, physics, hygiene or medicine, was to fly directly in the face of the Maker of the Universe and was, therefore, forbidden.	Before the Reformation, over twenty medical schools were founded, quite enough for the comparatively small population of Europe at the time. The course was five to seven years, instead of the two and three years of the nineteenth century. The lengthening of the course was due mainly to ecclesiastics—the maligned Pope John XXII one of them—and all of these schools did good work in the branches mentioned. (For a ready reference see Prof. Clifford Allbutt's address at St. Louis on "Medicine and Surgery Down to the Sixteenth Century.") One of the most prominent of these medical schools was that at Rome

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attached to the Sapienza, which owes its foundation to Pope Boniface, the same who is slandered as having forbidden anatomy, and to which many of the most distinguished anatomists of Italy were invited as professors.

To relieve the pain of the throbbing nerve was thought to thwart the wish of the Almighty.

Some form of anesthesia for surgical operations was in frequent use during the thirteenth, fourteenth and fifteenth centuries in Italy, as can be seen in any history of anesthesia. Ugone da Lucca invented a method of anesthesia that attracted much attention in the thirteenth century. At the end of this century the use of opium to relieve pain received a great stimulus from Simon Januensis, physician to Pope Nicholas IV.

For one thousand years in Papal Christendom the study of astronomy was considered criminal and frequently paid the penalty of imprisonment and death.

This is the only one of his original assertions Dr. Cruikshank chooses to defend in his answer. His defence is, of course, the well-known case of Galileo. One case of imprisonment in a thousand years; yet Dr. C. said, "*frequently paid the death penalty.*" Galileo's "prison" was the guest chamber of the palace of a cardinal friend. It is as if Dr. Cruikshank accused the Board of Health of permitting the ravages of an awfully fatal epidemic of diphtheria, and when challenged for proof brought one non-fatal case of very mild diphtheria, and even that one diagnosed something else by good authorities. In ordinary modern life such a mode of procedure would raise a laugh, and thereafter no one would pay any attention to his assertions.

Galileo's case was an incident and not a portion of a set policy. No one, who is not bigotedly intolerant, now views the Galileo case in the light in which it has been placed by President White in his book. The last word on the subject of Galileo is a quotation from a distinguished French authority to which Americans' attention was called by Mr. Holden, the librarian of our Military

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Academy at West Point. It was said by the perpetual secretary of the Paris Academy of Sciences, M. Bertrand, himself a great mathematician and historian, who declared that "the tale of Galileo's misfortunes has confirmed the triumph of the truth for which he suffered. Let us tell the whole truth. This great lesson was learned without any profound sorrow to Galileo; *and his long life, considered as a whole, was one of the most serene and enviable in the history of science.*"

Yet his case is cited as *proof* for the assertion that for *one thousand years* in Papal Christendom the study of astronomy was considered criminal and *frequently paid the penalty of imprisonment and death.*

Of Dr. Cruikshank's paper President White says: "Not only is there a historical basis for every leading statement of your article, but, though you make the lights and shadows somewhat strong, your whole contention seems to me in strictest accord with historical truth, as recognized by the writings of unbiased modern scholars." It is interesting to know that President White agrees with all these assertions of Dr. Cruikshank. One is prone to wonder if the agreement is for argument's sake only, or for the purpose of bringing out historical truth. It is true, President White adds: "I differ with you somewhat in my estimate of the general influence of the Church and its theology in the Middle Ages. An organization which produced the medieval cathedrals and the scholastic philosophy, superseded though the latter may now have become, was certainly not deficient in strong men and in earnest thought. But, while thus differing with you, I reiterate my conviction that your statements of fact, as regards the influence of dogmatic theology on science, are based on sound historical authority, Catholic as well as Protestant, and, what is better, upon documentary evidence, impossible to gainsay."

It is at least gratifying to find that Professor White has some kindly feeling toward the wonderful Middle Ages, but even this exception is made only to emphasize more completely his agreement with Dr. Cruikshank. The proof of any of these assertions of Dr. Cruikshank would revolutionize history.

Dr. Cruikshank suggests in his answer that I may have his paper put on the Index. May I reply that works of imagination, unless of very serious import, never find a place on the Index. In his defense, Dr. Cruikshank quotes Professor Ernst Haeckel, Now, an opinion from Professor Haeckel on a scientific subject is usually worth little enough. Professor His once showed

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that in order to make the embryos of the dog, the monkey and man look more alike for his scientific (?) purposes Haeckel prepared them for the press by taking the picture of one of them and then modifying it to suit the needs of his argument. Haeckel has long been discredited among German scientists. Virchow considered him a disgrace to German science. It is easy to see then how much his opinion is worth on a disputed historical question.

Dr. Cruikshank has been unfortunate in the selection of his reading. In many people it happens that the loss of faith in the eternal verities leads to the pinning of faith to some very fallible authorities. Still, under the circumstances, he is scarcely to be blamed. He confessedly takes his information at second hand, and when this is false, only his authorities can properly be held responsible.

President White expressed much surprise that the Professor of the History of Medicine at Fordham University should make some of the statements that he found in my article with regard to the supposed bull prohibiting chemistry. He may be still more surprised at many statements made in this present article. This little discussion of ours has had one much-appreciated result for me, however. As it seemed desirable that we should know one another, I obtained his permission to call on him. I spent a day under his roof and found him a most cordial host. With him as guide through the University of Cornell, I spent many pleasant hours. I should be glad to reciprocate by taking him through the University of Fordham. We teach the History of Medicine there rather differently to what is the custom in American colleges generally, but we try to get at truth and help others to it. May I say that the story of the Popes and what they did for medical education is an unwritten chapter in medical history that will shortly appear?

CONTROVERSY.

The Past! Why raise his mouldy corpse
Against the sentient spirit of To-day?
Let thought but serve to solve suspected truths,
And grant us light to part from Yesterday.

JOHN C. MACEVITT, M.D.

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GERMAN-AMERICAN INFLUENCE IN MEDICINE AND SURGERY.

By John C. Hemmeter, M.D., Phil.D., LL.D.,
Baltimore, Md.

COME with me to a brief study of the history of the American people at the dawn of their existence as an independent nation. There on the battle fields of the American revolution you will find many German-American physicians and surgeons devoting their energies to the cause of freedom and aiding in the efforts of a nation's struggle from darkness and bondage to light and liberty. Those of us who frequently hear of those hated Hessian mercenaries, who were hired by England and forced to fight unwillingly against those who were struggling for independence, should not cease to emphasize that on the side for American liberty there were also large numbers of Germans who wielded their mighty swords and brought into exercise their military knowledge and experience for right against might. And as there were many German-American revolutionists, who inflicted wounds upon the British armies, there were also many German physicians and surgeons skilled to heal the wounds that the American revolutionists received in battle.

A verse of Homer says:

> "A wise physician skilled our wounds to heal
> Is more than armies to the public weal."

and it was Cicero's opinion "that there is nothing in which men so approach the gods as when they give health to other men."

The well-known German epigram,

> "Wo man den Artz ehrt, kannst Du ruhig weilen
> Böse Menschen haben keine Lieder."

might be applied to the physician in this modified form:

> "Wo man den Arzt ehrt, kannst Du ruhig weilen
> Böse Menschen verstehen nicht zu heilen."

The German physician and surgeon, with his classical training and endowed with the theory and practice of the most renowned universities of Germany, was much in demand by the Americans during the Revolutionary War. To this must be added the natural inclination of medical men to be liberal minded

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in their political aspects—for who should understand better what are the inalienable rights of human beings than he who makes the intricate study of the body and soul his special business? After the Revolutionary War was over, and the wounds of the conflict healed, these men became even still more useful, not only in relieving suffering and combating diseases, but useful by virtue of their educational influence and the founding of institutions of learning. It is impossible within the narrow limits of this essay to give even an approximate description of the far-reaching influence of the German-American surgeons in the early part of the history of our country. An effort to do this would compel me to develop this article into a history of individuals, which is about the dryest kind of history there can be; whereas my idea is that it should be a history of medical and educational principles and of results. Nevertheless it would be unfair and impracticable to omit the names of a few of these great German-American pioneers of medicine and surgery. In addition to these, there are the men, even down to the present day, who are giants of learning and medical ability, working and living in the interest of the most advanced medical progress, and in our best medical institutions. To attempt to give due credit to the genius and influence of these German-American physicians and surgeons would lead me to falter in the effort to eulogize their work, and were I to reflect on their present and future influence for good it would lead me to falter at the idea of their potency and promise.

The most elaborate panegyric would seem but a weak impertinence, reminding me too vividly of a story by Sidney Smith, who, when he saw his little grandchild affectionately patting the back of a large sea turtle, said to her: "My dear, why do you do that?" "Grandfather, I do it to please the turtle," was the answer. Sidney Smith replied: "My dear, you might as well pat the dome of St. Paul's Cathedral with a view to pleasing the dean and the chapter."

My space and time has been limited and I can only mention a few of the German medical heroes whose work has been such a blessing to our republic. Among the earliest physicians of New York State was Dr. Hosack, editor of the first medical journal in the United States. Countless valiant fighters for health, of German extraction, have been active in New York State, and some of those who have done fundamental work are still living. Here I must mention the names of Lange, C. Herter, S. J.

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Meltzer, Boldt, Beck and Jacobi. In Schenectady, New York State, a monument was erected about two years ago to a German-American surgeon of prominence by the name of Von Spitzer (the Americans call him "de Spitzer"). My friend, Prof. Fred. Wilkens, then of Union College, Schenectady (now at the University of the City of New York), informs me that Von Spitzer was Surgeon-General of the colonial forces, and of the revolutionary army forces of the State of New York.

The great surgeon Wister, famed in the medical history of Philadelphia, was a German, and many most prominent in the profession in Philadelphia to-day are either German or the descendants of Germans. That magnificant surgical genius Nicholas Senn, Professor of Surgery at the new University of Chicago, and author of numerous epoch making discoveries and special works on surgery, is a German. J. Loeb, the distinguished Professor of Physiology at the University of California, research investigator of physiology and author of works of fundamental importance, was born near Bonn, on the Rhine.

The most influential German character active for the advancement of medicine in the State of Maryland during the eighteenth century was Dr. C. F. Weisenthal, who was born in Prussia in 1726 and settled in Baltimore in 1755. It was asserted by his relatives that he had been court physician to Frederick the Great, but this is not proven. On March 2, 1776, he was commissioned by the council as Surgeon-Major of the First Maryland Battalion under General Smallwood. Certain it is that he founded the first medical school in Maryland which was located on East Fayette Street, running from Gay to Frederick Street, Baltimore. This school passed out of existence when the Medical Department of the University of Maryland was chartered in 1807. (See: History of the University of Maryland," by Prof. Eugene F. Cordeil.)

Wiesenthal's influence was purely local, but it was of the best. He maintained a high standard here, both by example and precept, and was the most prominent German physician in this State in the eighteenth century. He never published anything of importance; there are however, some reports of cases by him which show that he was a skilled surgeon. He was consulted by the French surgeons in difficult cases during the Revolution. His son, Andrew, was educated at St. Thomas' Hospital, London, 1786-9, and was a noted teacher of anatomy, and also had a reputation as a surgeon. He continued his father's anatomical school in Balti-

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more until his early death in 1798. He was the discoverer of the "Syngamus Trachialis," a parasitic worm giving rise to Verminous Tracheo-bronchitis in fowls and birds. This was the first discovery of a parasite of an infectious disease in America. This article on the subject, dated 1797, was his only publication. Dr. Charles Frederick Wiesenthal was a zealous Lutheran and the first Lutheran church built in Baltimore owed its creation to the liberality and energy of this active physician. He was also president and physician to the German Society of Baltimore in 1784.

Dr. Conrad Small was a prominent German practitioner in Baltimore in the latter part of the eighteenth century. He was also quarantine physician. Three of the founders of the Medical and Chirurgical Faculty of Maryland were Germans—Jacob Schnively, Peter Waltz, of Washington County and John Thomas Schaaff, of Annapolis and later of Georgetown. Schaaff was the most prominent of these—born in Frederick County in 1752 of German parents, he practiced at Annapolis. He was the first Treasurer of the Medical and Chirurgical Faculty, 1799-1801, resigning at the latter date; member of Governor's Council, 1798-1800; visitor to St. John's College, Annapolis, 1802. He removed to Georgetown and was a founder of the Medical Society of the District of Columbia in 1819, and Vice-President of Columbia Institute. He practiced many years in Georgetown, and died there May 3, 1819. He was buried in the Congressional Cemetery at Washington. His tombstone refers to him as Alumnus of Edinburgh; his name does not appear among the graduates of this University, however. He was a man of great professional and social prominence. Dr. Schaaff published nothing of importance so far as I can ascertain.

Dr. Samuel Baker, of the University of Maryland, and the founder of the Medical and Chirurgical Faculty of Maryland, was the son of a German. A number of German names appear in the "Annals" among the Presidents of the Medical and Chirurgical Faculty, as, for example, those of M. S. and Jacob Baer, C. H. Ohr, W. M. Kemp, Miltenberger, Rohé, Friedenwald; and among the Vice-Presidents, Ritchie, Diffenderfer, Humrickhouse and Neuhauser. Lange and De Schweinitz are among the honorary members. There are many German names among the 2,400 embraced in the Biography of the Medical and Chirurgical Faculty of Maryland; *e. g.*, Heldman, Hoffman, L. H. Steiner, Simon, Steinecke, Dunkel, Swope (Schwab), Uhler, Benke,

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Wiss, Zeller, Zollickoffer, Salzer, Reuling, Pape, Laub, Klueber, and John Morris (Moritz), Keerl (Hessian surgeon captured at Trenton—a most interesting character), Ahl (surgeon in the Revolution), Frick (Geo. and Chas.), Hitt, Hintze, Gleitsman, Erich, Ealer, Coblentz, Bruce, Boerstle, Bantz, Morawetz, Ferdinand Reinhart, Mathieu, and a host of others.

Sir Henry Sumner Maine, in speaking of the Greeks, has said: "To one small people it was given to create the principles of progress. That people was the Greek. Except the blind forces of Nature nothing moves in this world which is not Greek in origin."

This statement, like all generalizing oratoric sentiment, must be taken *cum grano salis*. There are a great many things that move in the world of our present day which are not Greek in origin. All the practical applications of steam, light, heat and electricity, which have improved the conditions of mankind so immeasurably in the nineteenth century, are by no means Greek in origin. As far as modern progress in medicine and surgery is concerned, it is almost entirely German in origin. I do not by any means desire to ignore the achievements of the Pasteur Institute at Paris, or of the Institute for Experimental Medicine in St. Petersburg, or of the meritorious research of our own country, conducted under the auspices of the Carnegie and the Rockefeller Institutes, but the work of these research laboratories constitutes but a small fraction of modern medical advancement. Even in those instances where an important new contribution has been made by a worker of another nationality, his training and education have frequently been obtained in Germany. Everyone who has lived there long enough to enter into the life of that splendid race has faith in the future of Germany, which has been, to many Americans, a second fatherland, the country of their intellectual rebirth. Particularly is this true of medical men of the United States.

As we are indebted to the German people for their character and conscience, as we are indebted to them for their probity, good faith, sincerity, earnestness, their spirit of truth, and fidelity of expression in matters scientific, so the American people owe them an enduring debt of gratitude not only for the first pioneers of medicine and surgery in this country, but for subsequent inspiration of true medical learning that has obtained uninterruptedly ever since the foundation of our great nation.

Above all things we must bear in mind that to estimate the real value of the services of the German-American physicians and

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surgeons we must not limit ourselves to a critical consideration of their medical and surgical work only, but it also becomes our duty to take into account their influence on general education, for in a newly organized country the first men of education and culture are generally physicians, and it is they who bring with them the beginnings of general culture.

"Heil Dir Deutscher Artz,
Durch die Geschichte des freiesten und glorreichsten der Völker,
Tönt dein Ruhm
An der Wiege der Freiheit standest Du
Durch Jahrhunderte, daure fort, dein segensreiches Wirken."

A BIOGRAPHY OF FRANÇOIS MAGENDIE.

(*Continued.*)

By Percy M. Dawson, M.D.,
Associate Professor of Physiology, Johns Hopkins University, Baltimore, Md.

The Academy, 1821-1855.

Already in 1819 Magendie had been elected a member of the Academy of Medicine and now on November 19, 1821, he was called, largely, it is said, through the influence of Laplace, to fill the chair in the Academy of Sciences left vacant by the death of Corvisart.[53] Of the latter body, of which he was president during 1837, Magendie continued to be an active member for the next thirty-five years.

As much of the work of the Academy was performed by special committees elected from among its members, it was as a member of such committees that Magendie played a prominent rôle.

Committees for Verification.

The various activities with which the Academy was busied at that time might roughly be classified under four heads. In the first place the custom prevailed of appointing committees to inquire into the truth of papers presented before the Academy.

[53]See Adhémard Lecler, "Academie des Sciences," in *La grande encyclopédie*, Paris and Leipzig, Vol. I, p. 205. Desmarets Jean-Nicholas Corvisart (1755-1821) became, in 1797, Professor of Medicine at the Collége de France; later, physician to Napoleon, and in 1811 a member of the Académie des Sciences.

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Thus the half dozen memoirs which Magendie himself had read before the Academy had been passed upon by committees made up of Cuvier, Humboldt, Pinel, Percy, Halle and Thenard; and now that Magendie had become an academician, it fell to his lot to examine many of the communications made by others. This often entailed a great deal of labor, for the more important experiments described by the authors had to be repeated and their truth or error demonstrated. But Magendie entered into this work with such unusual zeal that he was often carried far beyond the limits of simple verification, and his reports to the Academy often bore the character of independent researches.

Committees on Prizes.

A second branch of academic committee work was the examination of the claims of competitors for certain prizes. The latter had been founded by various philanthropic persons and to the Academy had been given the privilege of awarding them. This it did upon the recommendation of special committees of academicians elected by ballot. Those prizes in which Magendie was especially interested were the following:

1. The prize in experimental physiology, founded by Baron Montyon. To this reference has already been made. It consisted in a sum of 900 fr. and was awarded annually "for the best contribution to the progress of experimental physiology, printed or written."

2. The prize in medicine and surgery;[54] also a Montyon foundation. This prize—or rather these prizes—aggregated a considerable sum, amounting sometimes to as much as 17,000 fr. It was distributed annually among several competitors in amounts proportionate to their respective merits.

3. The great prize in the physical sciences, a medal and 3,000 fr., awarded by the Academy at intervals of several years.

Exactly how many times Magendie served on these committees is uncertain, but from the time that the proceedings of the Academy began to be regularly published (1835), Magendie's name was never absent from any of them until his death in 1855.[55] He served twice, moreover, as one of the five judges of the Mon-

[54] "For the authors of the works or discoveries most useful to the art of healing.—*Compt. rend. Acad. d. Sc.*

[55] A note in the *J. d. physiol expér e. path.* (1828, vii, p. 136), states that Magendie was one of the committee on the prize of medicine and surgery for the preceding year.

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tyon prize "relating to the means of rendering an art or trade less unhealthy," and twice on the committee for awarding the Manni prize for the best contribution to the subject of apparent death, and also in the case of many special prizes offered but once, or perhaps but for a few times by enthusiasts who desired to be the means of contributing something to human knowledge with respect to certain subjects of special interest to themselves.

The Gelatin, Hippiatric and Other Commissions.

Thirdly, the Academy frequently elected committees for the purpose of arbitration or research, or elected representatives upon the commissions which were from time to time formed under various departments of the government.

Magendie was frequently called upon to take part in this sort of work and among the commissions of which he was a member may be mentioned the following: The commission established by the Minister of Public Instruction in which Magendie was associated with MM. de Cardaillac, Professor of Philosophy, and Letronne, Inspector-General of Studies, which had for its object the investigation of the new method of teaching children to read proposed by M. Laffore.[56] Later, at the request of the same ministry, he took part in the proceedings of the committee for considering the advisability of sending a physician to Germany to study the methods of treatment employed at the various watering places in that country.[57] There were also the commissions to note the effect on sheep of large doses of arsenic, to report upon an artificial arm presented to the Academy by the Dutch sculptor, Van Petersen,[58] to consider the proposed suppression of the botanical garden in Toulon,[59] and so forth.[60] Two of the commissions of which Magendie was a member were of sufficient importance to merit especial attention. They were the Hippiatric Commission and the yet more famous Gelatin Commission.

The Hippiatric Commission.

In September, 1836, the Minister of Public Instruction[61] in-

[56] "Rapport, etc." J: 1829, ix, p. 364.

[57] "Rapport, etc.," (Com. M.M. Pouillet et Magendie, rap.).C: 1850, xxx, p. 471.

[58] C: 1845, xx, p. 428.

[59] "Rapport, etc." C: 1849, xxix, p. 369.

[60] See *ibid.*, 1839, ix, p. 536; and 1841, xiii, p. 940.

[61] C: Sept., 1836, iii, p. 372.

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vited the Academy to appoint one of its members to take part in a commission organized in accordance with a decision of the Minister of War, for the purpose of supervising the experiments relating to the treatment of glanders in horses, proposed by M. Galy. Magendie was forthwith elected.

Four years later the new Minister of War appealed directly to the Academy.[62] He stated that, since the loss of horses from glanders had been out of all proportion to that occurring in foreign armies, a commission of army officers had been appointed by his predecessor to look into the matter, and that this commission had now stated its opinion that the ravages of the disease were due to the unhealthiness of the stables and advised certain improvements. On the matter of ventilation, however, the minister wished the advice of the Academy. The latter, therefore, appointed a commission composed of Magendie, Chevreul, Poncelet, Breschet and Boussingault[63] to attend to the matter.

The work of Magendie upon these commissions doubtless met with the approval of the authorities, for when in 1844 the Hippiatric Commission was organized under the War Department, Magendie was appointed president. Besides the four academicians, Magendie, Rayer, Payen and Boussingault, the commission comprised M. Crétu (*maître de requêts*), the director of the Alfort veterinary college, a member of the Academy of Medicine, the chief veterinarian of the municipal guard, four veterinarians of the army and a chemist.

Within the next fourteen years this commission published four volumes of memoirs, and to these Magendie and Rayer made valuable contributions in experimental physiology. One of these memoirs (89) was read by Magendie before the Academy in 1845. It was a comparative study of the parotid and mixed saliva of the horse with relation to chemical composition and action upon food.

The Gelatin Commission.

At the beginning of the nineteenth century[64] several chemists, among whom was d'Arcet, Sr.,[65] were busying themselves in experiments which had for their object the extraction of the organic material from bones. At that time it was believed that as much

[62] *Ibid*, Jan., 1840, x, p. 73.

[63] *Ibidem*, p. 74.

[64] See *Bull, Acad. d. Méd.*, xv, p. 324, Jan. 8, 1850 p. 367, Jan. 22, 1850.

[65] D'Arcet (C:) or Darcet (*Bull. Acad. d. Méd.*)

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bouillon could be obtained from one pound of bones as from six pounds of meat, and hence it was as a problem in institutional economics that the work of these investigators was viewed with interest. In 1817 d'Arcet, Jr., devised a new method of extracting the bones, a device which soon supplanted the older methods in which the use of papain or boiling with acids had been resorted to. The statement of d'Arcet that he was now able to make five beeves out of four, coupled with the approval with which the Collége de France looked upon his results, led to the quite general introduction of d'Arcet's extract of bones into the hospitals and almshouse in Paris, where 60 grams of this gelatin were regarded as equivalent to 1,500 grams of meat.

But soon criticisms and complaints began to arise in various quarters. On June 30, 1821, M. Donné read a paper[66] before the Academy of Sciences. He had experimented on himself, he said, and had promptly lost two pounds in weight, while animals which he had fed with gelatin soon showed such a distaste for it that they preferred to die of starvation rather than eat it.

Moreover, on November 8th of the same year appeared a report[67] of the physicians and surgeons of the Hôtel-Dieu. Their six conclusions can be summarized by saying that in comparison with the bouillon made with meat, that in which gelatin was employed was more distastful, more putrescible, less digestible, less nutritious and that, moreover, it often brought on diarrhea. This report was signed by Petit, Recannier, Caillard, Baron Dupuytren, Breschet, Guéneau de Mussy, Honoré Husson, Sanson, Magendie, Bally, Henri Duval and Gendrin, sec.

The Academy of Sciences now took steps in the matter and appointed a committee of investigation known as the "Gelatin Commission."

Two years later (1833) Edwards and Balzac[68] reported before the Academy a series of experiments on dogs in which they showed that although gelatin had some nutritive value, it was incapable of sustaining life. In the following year (1834) Grannal,[69] after performing some experiments upon his own family and some of the students at the Val-de-Grace, reported to the

[66]Meeting of the Academy, June 6, 1831; also, "Mémoire sur l'emploi de la gélatine comme substance alimentaire Paris, 1835. 8vo.

[67]C: Aug., 1841, xiii, p. 286.

[68]*Arch. gén. de méd.*, Paris, 1833, 2. Ser., i, p. 313.

[69]Meeting of the Academy, Sept. 1, 1834. *Gaz. méd. d. Paris*, 1834, 2. Ser., v, p. 578.

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Academy results which were extremely unfavorable to the use of gelatin.

But the Gelatin Commission remained silent, and as years passed various individuals began to show signs of impatience. Seven years had gone by when M. Grannal[70] asked the Academy to urge the members of the commission to bring in their report. To this Magendie, who was at that time President of the Academy, replied that the experiments of the commission were still in progress and that he was unable to say when they would be completed. In the following year some remarks of M. Arago hinting at the slowness of the commission called forth a formal protest from Dumas, Thenard and Magendie, and Arago apologized.[71]

At last the report[72] was ready on August 2, 1841. Magendie presented it to the Academy in the name of the commissioners, Thenard, president;[73] d'Arcet, Dumas, Flourens, Breschet, Serres and himself. In the introduction Magendie called attention to the fact that M. d'Arcet had tactfully declined taking any part in the experimental work, but had rendered valuable assistance in collecting documents relating to the gelatin question. He then proceeded to say that, considering the problem of finding the nutritive value of certain gelatin soups too narrow, the question which the commission proposed to itself was this: "Can one by an economical procedure extract from bones a food which, either when eaten alone or when mixed with other substances, can take the place of meat?" In order to facilitate this inquiry the commission had been divided into two sections; one composed of chemists, while to the other was allotted the physiological experiments. These sections now presented a joint report.

The scope and character of the work can readily be seen from the titles of a few of the various sections into which the report was divided:

History of the extraction of gelatin and its employment as a food.

Experiments on gelatin, pure, flavored, in fasting, in association with other substances.

Experiments on gelatin and meat bouillon.

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[70] C: 1837, iv, p. 183.

[71] *Ibid,* 1838, vii, p. 1131.

[72] "Rapport fait à l'Acad. d. Sc. au nom d. l. Commission dit d. l. gélatine." *Ibid,* 1841, xiii, pp. 237-283.

[73] *Ibid,* 1844, xviii, p. 986.

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Comparative chemistry of various bouillons.

Experiments on the parenchyma of bones, on tendons, on the nutritive properties of albumen, fibrin, etc. mixed, unmixed, flavored or unflavored.

"We are very conservative in our conclusions," ran the report; "but we can state the following positively:

"1. By no known process can there be extracted from bones a substance which, either when taken alone or when mixed with other substances, can replace meat.

"2. Gelatin, fibrin, albumen, taken alone, support animals for a very limited time. In general these substances soon excite an intolerable distaste to a degree which renders starvation preferable.

"3. The same immediate principles artificially united, and rendered of an agreeable sapidity by seasoning, are accepted with more resignation and for a longer time than when they are isolated; but finally they have no better effect upon the nutrition, for animals which eat them, even in considerable quantities, die with the symptoms of complete inanition.

"4. Meat (muscle) in which gelatin, albumen and fibrin are united by the laws of organic nature and are associated with other materials as fats, salts, etc., suffice even in very small quantities for a complete and prolonged nutrition."

The remaining five conclusions, though interesting, are perhaps of somewhat less importance than those which have already been quoted.

The work of the Gelatin Commission was not completed with this report, but as Magendie seems to have resigned[74] a few years later, before the appearance of a second report, the doings of the commission cease to have any bearing on this biography.

Memoirs, the "Comptes Rendus."

The last and perhaps the most important phase of Academic activity was the presentation at the meetings of that body of memoirs recording the results of original investigations. The papers which Magendie read before the Academy were numerous and their contents varied. At first they were published either in the form of monographs or in one of several medical and scientific periodicals, especially in the medical journal of Leroux and the *Journal de Physiologie Expérimentale*. To these earlier memoirs reference has already been made.

[74] See C: 1844, xviii, p. 564.

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In 1831 Magendie's journal came to an end, but soon (1835) another and still more famous periodical came into existence, the *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences.*

Nothing impresses one with the wonderful intellectual life of Paris at that time more than simply running the eye down the list of contributors to the first volume of the *Comptes.*

Agassiz,	Berthelot,	Gay-Lussac,
Ampère,	Biot,	Humboldt,
Arago,	Cuvier,	Geoffroy-Saint-Hilaire,
Baudelocque,	Delacroix,	Laplace,
Becquerel,	Flourens,	Magendie.

Of all Magendie's contributions to the *Comptes,* of which there were about a dozen in the next twenty years, the most interesting was his series of articles on recurrent sensibility. In the second paper on the function of the spinal nerve roots, which Magendie published in his *Journal* in 1822, he described not only the effect of section of the roots upon the convulsions caused by strychnia, but also the results obtained by direct stimulation of the roots. These results were surprising, for on stimulation of the anterior roots Magendie obtained signs of pain, while stimulation of the posterior roots caused muscular movements. To the latter phenomenon he does not again refer, so that one is left in the dark as to whether it was a reflex or an error in observation. The fact, however, that stimulation of the anterior roots causes pain seems to have again recurred to his thoughts.

On May 20th, 1839, Magendie communicated to the Academy the results of some experiments on the nervous system (83). The author's summary of his results reads as follows: "The sensory and motor nerve of the cord are both sensitive when both are intact.

"If one cuts the sensory nerves, the motor nerves immediately lose their sensibility.

"If one cuts the motor nerves in the middle, the end which remains attached to the spinal cord is quite insensible; the opposite end, on the contrary, retains an extreme sensibility. In this case the sensibility goes from the periphery to the centre.

"If one cuts the sensory nerves in the middle, the end which is attached to the cord is very sensitive; the end which is adjacent to the ganglion has, on the contrary, lost all its sensibility."

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A few weeks later Magendie presented a second paper (84) before the Academy. In this he declared that having been impressed by the fact that the sensibility of the ventral roots depends upon the integrity of the dorsal roots, he was minded to try similar experiments on the columns of the cord. He therefore stimulated the ventral columns of the cord and found that they showed evident sensibility, although they were not so exquisitely sensitive as the dorsal columns. This sensibility of the ventral columns disappeared in great part, not only on section of the dorsal roots, but on section of the ventral roots also. Why this round-about path? Magendie said that he did not know, and that more experiments ought to be made for investigating this subject.

At the next meeting of the Academy a letter[75] from M. A. Longet was read in which the author claimed for himself the credit of the discovery of recurrent sensibility. He stated that he had performed the essential experiment in the presence of Magendie, and that all Magendie had done was to confirm and amplify it before hurrying off to the Academy to report the discovery as his own. Without entering into the details of the Longet-Magendie dispute, which was soon dropped, it may be said that both Bernard and Flourens appear to have disregarded entirely Longet's claim, but it seems probable that Magendie did not give enough credit to Longet for his experiment, and that consequently the latter was led to claim a good deal more than was his due.

The spinal nerve roots seem to have brought more trouble in their train than any other structure investigated by Magendie. One of his discoveries was claimed for Bell, another was claimed by Longet. Nor did this end the matter, for when in 1847 Magendie again reports upon the subject of recurrent sensibility (91), he complains sadly that the Academy had not treated him fairly, for it had on two occasions honored memoirs in which his results in regard to this phenomenon were pronounced erroneous. He then proceeds to repeat all his previous statements concerning recurrent sensibility, and next to describe some new experiments which amplify and confirm the results already obtained. Finally he reports a series of experiments which he had performed in company with Claude Bernard, and which proved that the sensory function of the facial nerve depends entirely for its presence upon the integrity of the trigeminal.

[75] A. Longet. Fait physiologique relatif aux racine d. nerfs rachidiens. C: 1839, viii, p. 881.

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Of the other articles published in the *Comptes* some are of considerable interest. With Bernard (93) he showed that stimulation of the dorsal spinal nerve roots causes a rise in the blood pressure, and that the same result could be obtained on stimulation of a ventral root, but only when the dorsal root was intact as in the case of recurrent sensibility. He observed also that this change in the circulation occurred in the absence of all signs of pain on the part of the animal.

In another paper (90) he comments on the interest felt by chemists in the study of ferments and catalytic action. He then describes as the result of his own researches the discovery of a new property of the blood, namly, that of converting starch into glucose and dextrine. Starch injected into the blood disappeared and in its place dextrose could be demonstrated.

Besides the articles already referred to there are others of somewhat less interest, such as the three reports on nervous cases treated with galvanism (80, 81, 85), a note on the composition of the blood in various diseases (86), an article on the action of ammonium nitrosulphate on animals and man (78), and another on the cow-pox (88.)

It was a custom for each academician to present a copy of his latest book at one of the sessions of the Academy, sometimes accompanying it with a short summary of its contents. Consequently the *Comptes rendus* contains notices and abstracts of many of Magendie's larger works.

Personality of the Academician, Magendie.

Although an able academician, whose clear sight and energy made him invaluable as a worker, the asperity of his character was such that it must have rendered his presence at times a source of great discomfort to his colleagues. "His eradicable sarcasm spared no one. His abrupt sallies by their very suddenness disconcerted all prevision and set at naught all academic tradition. He never insinuated that an opinion was erroneous or a fact misstated, he plainly said so."

"Our honorable colleague," cried Magendie,[76] when Breschet had finished reading his paper on glanders,[77] "our honorable colleague has just passed judgment in a manner so positive, so

[76] C: Feb. 10, 1840, x, p. 223.

[77] Breschet and Rayer: De l. Morve chez l'homme, chez l. solipèdes e. quelques autres mammifères. C: Feb. 10, 1840, x, p. 209.

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absolute, upon certain questions of the greatest importance, that wishing to reply and believing that I can do so with some success, I find myself with no other resource than to employ phrases both sharp and clear, which might compare without disadvantage with those which he used.

"I say to my honorable colleague, without any oratorical precautions, when you say that chronic glanders is the same disease as acute glanders you are wrong! When you say that chronic glanders is contagious you are wrong again! When you say that chronic glanders is transmitted to man by way of contagion you are expressing an opinion which nothing proves and which, if it were spread about on the authority of your words, might have the most disastrous consequences.

"I could easily multiply the number of these denials, but I will confine myself for the moment to the three principal points discussed in your memoir." . . .

The incident above quoted is by no means unique, for Magendie never left any room for doubt with regard to his meaning.[78] Flourens moreover intimates that Magendie claimed for himself the whole field of physiology, and that no experiments could be done or discoveries made without arousing his jealousy. But Bernard leads us to believe that it was really a matter of principle which led him to seek so diligently for the flaws in the work of others, that he might by so doing the more readily arrive at the truth. It is probable that an impartial critic to-day, one who had not himself been roughly handled, as Flourens had been, by this perhaps over-strenuous skeptic, would agree with Bernard and would see in Magendie a rough but honest champion who hacked and hewed his way toward the truth utterly regardless of the more sensitive feelings of others and utterly contemptuous of the shallow euphemisms which society at all times fosters, Magendie's method was, however, so unusual that another instance should be cited to emphasize and illustrate this important trait in his character. One of the best instances of his violent and unexpected attacks is found in the records of the other controversy which took place in 1847. On February 1st of that year Velpeau read before the Academy a note "On the Effects of Ether." [79] He recorded the results of numerous operations with this anesthetic. For the relaxing of muscles in the setting of fractures and the

[78] See C: 1839, ix, p. 776; 1845, xxi, p. 51; and 1849, xxix, p. 417.

[79] Sur. l. effets d. l'éther. C: Feb. 1, 1847, xxiv, p. 129. Feb. 1, 1847.

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reduction of dislocations, he had also found it most useful. He dwelt upon the wonderful result of ether anesthesia and his discourse glowed with enthusiasm.

Velpeau's remarks, however, called forth a perfect tirade on the part of Magendie,[80] who in a long harangue soundly rated the surgeons in general and Velpeau in particular. "The surgeons," said he in substance, though these were not his exact words, "are catering to the public demand for the miraculous and sensational. They perform experiments on human beings which cannot be justified. Our knowledge of this drug is too scanty to warrant this wholesale use of it. Unconsciousness may be produced by other drugs, such as alcohol, but they are not used in operations for very obvious reasons, yet the surgeons hasten to employ ether, a drug with which we are so little acquainted. Might not the use of ether initiate in patients a craving for it? Who, indeed, would commit himself while in a state of complete unconsciousness into the hands of a surgeon when bungling and malpractice might go on unknown to him? Would one not rather endure the pain? Of what use is an anesthetic which still permits the patients to shout and struggle as though tormented with horrible dreams? Finally, may not the knowledge of the ease with which it can be employed lead to its use for criminal purposes?"

In replying,[81] Velpeau expressed his great astonishment at Magendie's attack. He resented the implication that he was a rash experimenter. Who indeed in all Europe was more free in resorting to experiments both on man and animals than he who had just attacked the surgeons? Ether had been abundantly tested by the most accomplished persons both in America and in England. Velpeau then at some length explained to the Academy that the facts advanced by Magendie were exceptional and that his fears were groundless. But Magendie was not silenced. "He would not reply," he said, "to M. Velpeau, who had contested none of his assertions. He would, however, show the disadvantages of ether anesthesia. In long operations one dares not use it for our knowledge of the after-effects of the drug is to scanty; it is contraindicated in operations near nerves which might be cut or tied but for the warning given by the conscious patient; in parturition it is worse than useless since it interferes with the

[80] *Ibid*, p. 134.
[81] C: Feb. 1, 1847, xxiv, p. 138.

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normal pains; in mouth and face operations it should not be used lest the blood should fill up the lungs of the helpless patient. Such examples might be multiplied indefinitely."

The next meeting of the Academy was opened by a paper by Roux on "The Effects of Ether."[82] This again aroused Magendie, who at once began a long and vehement discourse[83] which may be paraphrased and abridged as follows: "If, at the last meeting of the Academy, my words seemed to be marked by a certain degree of animation, I beg you to note that they were directed less against a new therapeutic agent than against the extreme eagerness with which patients have everywhere been experimented upon.

"During the past week the subject of ether narcosis has been engrossing all minds. Among the many cases operated upon, we hear of those in which the giving of ether was accompanied by cries, lamentations and signs of suffering. Three cases have been reported by Vidal, in which there was sensory exaltation so that the pain of the operation was increased. In three women who had come to the Versailles hospital, for the extraction of some teeth, the administration of ether was followed by convulsions, recurring for several days. In some there have been dreams, the most unpleasant and the most violent and sometimes even a condition resembling delirium tremens. The dreams are sometimes extraordinarily erotic in character. Women thus intoxcated have been seen to rush upon the surgeon-operator with such evident intention that in this singular and novel situation the danger is no longer to the patient, but to the surgeon." [Laughter.]

"I should hope," he continued, "that no one supposes that I had the intention of provoking hilarity. On the contrary, I regard the consequences of ether intoxication as extremely serious. I should be very unhappy if my wife or my daughter had been the subject of scenes similar to those of which I have been a witness, in which chaste and modest girls have been transformed in a few minutes into bacchanals. Might not the taking of ether lead to results similar to those produced by the hashish and opium of the Orient?"

Magendie then proceeded to describe in detail the distressing results of the administration of ether in a case of excision of the

[82]Sur. l. effets d. l'éther., C: Feb. 8, 1847, xxiv, p. 168.
[83]*Ibid*, p. 170.

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tonsils. The fact, he said, had been obtained from a physician who had been present at the operation which took place at the Charité. In conclusion, he expressed his belief that the zeal and activity which have characterized surgeons during the last few days might contribute greatly to our knowledge of the effects of ether anesthesia.

Roux,[84] whose paper had been the cause of this second attack upon anesthesia, replied much as Velpeau had done at the preceding meeting. Magendie's objections were not serious, for such cases as those reported were quite exceptional. Then Velpeau, the surgeon of the Charité, began to defend himself; Magendie had not told all that there was to tell with regard to the tonsilar excision. The young man on whom the operation had been performed, a very neurotic individual, had insisted on being etherized. He had never been completely under the influence of the anesthetic and his subsequent symptoms were due to hysteria. He added that he had never stated that ether was of value in all cases. He knew that in operations in the mouth it was of little value and he knew of many other cases in which the usefulness of ether was more than questionable.

This, however, did not close the incident, for a week later Magendie laid before the Academy a letter from M. Constantin James,[85] confirming the statements made by Magendie with regard to the patient at the Charité. Velpeau was, however, prepared for this and forthwith produced a letter signed by his three internes, who denied some of the assertions made by Magendie. He then proceeded to discuss at length the advantages and limitations of ether anesthesia, concluding with the words: "Finally, there is one remark which I shall permit myself to make to the public and the laity; it is that ether in doing away with pain does not remove the danger of the operation, and that the possibility of operating without suffering is not a reason for operating without necessity."

Then Magendie again spoke:[86] "Since my colleagues have come to acknowledge the dangers of the administration of ether and the precaution required in using it, I regard the discussion as terminated, the more so if they put into practice the opinions which they profess.

"I do not regard the testimony of three of M. Velpeau's

[84] C: Feb. 8, 1847, xxiv, p. 175.
[85] C: Feb. 15, 1847, xxiv, p. 230.
[86] *Ibid*, p. 238.

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pupils as of equal value to that of a physician and former interne at the hospital in question, but this discussion is becoming personal and ought not to be continued before the Academy."

Magendie then concluded with the following words: "Gentlemen, in throwing myself against the general infatuation, in protesting against experiments made upon men with a substance of whose properties we have not a complete knowledge even today, I knew very well that I would raise up formidable opposition. But I declare that after having devoted so many years to labors which, unless I deceive myself, have not been sterile for the welfare of humanity, I had not expected to be represented as the apostle of pain, and, shall I say it? as opposing a useful discovery for the sole reason that it did not emanate from myself! But what does it matter! I have the consciousness of having performed a duty in putting my colleagues and the Academy itself on guard against an innovation which, though it may have some day a real utility, has already resulted in sad consequences and can be the occasion of deplorable abuses."

As has already been stated, this is by no means the only instance[87] of Magendie's belligerent nature. Sometimes in his dispute with M. Payen, he was shown to be clearly in the wrong, having been guilty of unintentional misstatement. In this case Magendie frankly and publicly acknowledged[88] his error when the latter was shown to him.

(To be continued.)

[87] See also the discussion following the report of Regnault. C: 1841, p. 1076.

[88] C: March 6, 1843, xvi, p. 554; and March 20, 1843, xvi.

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Vol. 4 September, 1906 No. 3

EDITORIAL.

THE "INDEX MEDICUS."

IN an announcement recently sent out the Carnegie Institution management states that "Unless it appears that the *Index Medicus* is of greater service to the medical profession and can help to support itself to a greater extent than in the past, it may become advisable to discontinue its publication."

We do not regard it as necessary to marshal a long array of facts to make it appear "that the *Index Medicus* is of greater service to the medical profession," so evident and widely recognized is the value of current medical literature and so acknowledgedly indispensable is the tool that makes this literature readily available to every practitioner. It may be an open question upon whom the responsibility for the meagre subscription support accorded the *Index Medicus* rests—whether it is actually due to a general apathy on the part of the medical profession, not in appreciating

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the value of the publication but in the individual's putting off the burden of sharing the expense upon the shoulders of the "other fellows," or whether it is due in some measure to the publishers' apathy in presenting the matter squarely and forcibly to those who ought to subscribe.

The class of those who should be subscribers is sufficiently large to put the *Index Medicus* on a sound financial basis. Roughly, this class may be divided into medical libraries and those devoted to the allied sciences, law libraries, medical societies throughout the world (those who do not maintain a library, but who at least could be counted upon to provide for their members an index of the world's medical literature at a cost of but five dollars per annum), individual members of the profession (especially those who are actively engaged in medical literature) and last, but not least, a very large portion of the general libraries throughout the land. Let the physicians of every community thoroughly understand the situation and the fact that the resources of the Library of the Surgeon General's Library are open to them through their local library, and we believe a sufficient number of enlightened physicians would be found to insist on the local library's providing for them the index which makes these resources available. It is our further opinion that some of the *Journal of the American Medical Association's* marvellous energy shown in the propaganda against the manufacturers of proprietary medicines might very wisely be directed in support of the cause of the *Index Medicus* and in support of the cause of medical libraries in general, to the advantage of the whole medical profession of the United States.

Inquiry has elicited the fact that at present writing there are but 532 actual subscribers to the *Index Medicus*, of which number 386 are in the United States. These subscriptions defray but about one-fifth the actual cost of publication. We take pleasure in excerpting from the recent announcement sent out by the Carnegie Institution of Washington, the publishers of the *Index Medicus*.

"The *Index Medicus* was established in 1879 * * * and was discontinued in 1899" (on account of inadequate financial support). "The present series" (subsidized in part by the Carnegie Institution funds) "began with the number for January, 1903. Each number of the *Index* presents the literature of the month named on its cover and is issued as early as possible in the succeeding month, time being allowed for the arrival of foreign journals.

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transactions of medical and scientific societies, and the like, arranged under subject-headings. The titles in certain languages, as Russian, Polish, Swedish, Danish, Finnish, Hungarian, Bohemian, Roumanian, and Japanese, are translated into English.

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"Unless it appears that the *Index Medicus* is of greater service to the medical profession and can help to support itself to a greater extent than in the past, it may become advisable to discontinue its publication."

NOTES AND NEWS.

The Library of the Johns Hopkins Hospital and Medical School has received two valuable collections of books, aggregating nearly 2,000 volumes, donated by William A. Marburg, Esq., and Francis M. Jenks, Esq., both of Baltimore, Md. One, the old Warrington Dispensary collection, of Liverpool, contains many old works of the sixteenth, seventeenth and eighteenth centuries. The other collection is the Friedrich Ahefeld Library, from Marburg, Germany.

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The Berlin Academy of Sciences has been examining the rich collection of ancient medical manuscripts in its library, and has just published the first volume of a descriptive catalog devoted to works dealing with Hippocrates and Galen. When the complete catalogue has been issued, it is proposed to publish all the manuscripts in full.

NEW JOURNALS.

Annales des Maladies Vénériennes. Fondées en 1906. Publiées sous la direction de E. Gaucher. Rédacteur en Chef: Dr. Levy-Bing. Vol. 1, No. 1, August, 1906. Paris, 22 Place St. Georges. Yearly: Frs. 25.

Archives of the Public Health Laboratory of the University of Manchester. Edited by A. S. Delépine. Vol. 1, 1906. Manchester, University Press.

Bio-Chemical (The) Journal. Edited by B. Moore and E. Whitley. Vol. 1, No. 1, January, 1906. Published Monthly. Liverpool, University Press. Yearly: 15s.

Biochemische Zeitschrift. Hrsg. von E. Buchner [et al.]. Redigiert von C. Neuberg. Vol. I, Nos. 1-2, June 21, 1906. Berlin, J. Springer. Yearly: Mks. 13:50.

Grenzfragen der Literatur und Medizin. Hrsg. von S. Rahmer. München, 1906. Each number Mk. 1.

Physikalische Therapie in Einzeldarstellungen. Hrsg. von J. Marcuse und A. Strasser. Heft 1, March, 1906. Stuttgart, F. Enke.

West Virginia (The) Medical Journal. Published Bi-Monthly by the West Virginia State Medical Association. Vol. 1, No. 1, August, 1906. Wheeling, W. Va., 81 Twelfth Street. Yearly: $1.00.

Zeitschrift für Säuglingsfürsorge. Hrsg. von Behring [et al.]. Redigiert von Dr. B. Salge. Published Monthly. Vol. 1, No. 1, July, 1906. Leipzig, J. A. Barth. Yearly: Mks. 12.

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THE LESSON IN ANATOMY.

Facsimile reproduction from the *Fasciculus Medicinae* of Joannes de Ketham (Folio, Impressum Venetiis per Joannem et Gregorium de Gregoriis fratres anno domini MCCCCC, die xxviii Martii.) From a copy in the library of Howard A. Kelly, M.D., of Baltimore, Md. This drawing first appeared in the 1493 edition of de Ketham.

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MEDICAL LIBRARY AND HISTORICAL JOURNAL

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THE MONDINO MYTH.

By Lewis Stephen Pilcher, A.M., M.D., LL.D.

Brooklyn-New York.

TO a physician who is at all interested in the history of the development of medicine, the old Italian universities will ever afford a most interesting field of study and regard. The heroic age in medicine was lived beneath Italian skies. How many of the men who were the creators of medical learning lived in Italian cities? In Padua, Vesalius, Columbus, and Fabricius of Aquapendente taught; Harvey studied; and Galileo, after he had exchanged Hippocrates and Galen for Euclid and Archimedes, carried on his researches into the constitution of the universe.

At Pisa, Cesalpinus taught, and Galileo studied. At Salernum, whose school of medicine was cradled in the cloisters of the monastery of Monte Casino, and was fostered by the Normans during their rule over southern Italy and Sicily, medical learning was developed to its highest degree, and achieved its greatest reputation during the times of the Crusades, when it healed the wounds and cured the diseases of cross-bearing knights and potentates. Salernum preserved and taught the elements of medicine, as transmitted through the Arabians, from the seventh to the fourteenth centuries during which period it was the chief seat of medical learning in the civilized world. Its history remains as one of the most brilliant and interesting chapters of the Dark Ages.

When Salernum had already begun to decline, and Padua was in its infancy, the school of Bologna was at its apogee. Begun in the middle of the eleventh century with schools of sacred letters and civil and canonical law, by the close of the thirteenth century there had been added schools of medicine and philosophy; and to it had been attracted in a single year, not from Italy alone, but from every part of Europe as far north as the British Isles,

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ten thousand students. To Bologna was assigned the rare privilege of connecting the old learning and the new, and of occupying a place of equal prominence in each. Its medical school, however, belongs to the new, for it begins with the date 1260, when Taddeo di Alderotto came from Florence and began the teaching and practice of medicine in Bologna.

Taddeo was one of those men who have the gift of impressing those with whom they come in contact with exalted ideas of their worth and attainments. He seems to have burst upon the Bolognese in full-orbed splendor, for of his previous training and career there is no record, even his parentage is a matter of dispute. Settled in Bologna, he acquired in a short time extraordinary celebrity and immense riches. He was easily the first citizen of the city, whose fame shed glory on all his compatriots; they heaped honors upon him as a benefactor of the community, even so far as to vote that he should be relieved from the burden of paying taxes to the commonwealth, in which we see a suggestion of the modern practice of relieving churches and hospitals of taxation. To the school of medical teaching, which he instituted, the City Council granted all the privileges, which up to that time had been allowed only to the teachers and students of law, with which older schools that of Taddeo was thus placed upon an equal footing.

The contemporary historian, Giovanni Villani, speaks of him as "The greatest physician in Christendom;" and Dante, who spent some time in Bologna, shortly after the death of Taddeo, before he wrote the "Divina Commedia," must have found the spirit of Taddeo still dominant, for when (del Paradiso, Canto XII, v, 83) he would contrast the spiritual aim of St. Dominic with that of men of more earthly mold, Thaddeus' name flows from his pen, thus:

"Not for the good of this world for which men now toil, following him of Ostia and Thaddeus, but for love of the true manna, he (Dominic) became in short time a great teacher." (Translated by Norton.)

Taddeo was not only an influential man of affairs, a physician of high repute and a teacher of great power, but he was a philosopher and an author. It was he who first made use of the writings of the ancient philosophers in commenting upon the works of Hippocrates and Galen; he translated the "Ethics" of Aristotle; he exhausted the erudition of the Arabs. To the spirit which from his professorial chair he infused into the teaching and

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study of medicine, undoubtedly is due the high position which, for many generations thereafter, the school of Bologna continued to maintain as a centre of medical teaching. It needs no great stretch of the imagination to picture somewhat of the effect that contact with such a man might have in molding the character of his young neighbor and pupil, the chemist's son, who, a few years later, by his devotion to the study of human anatomy was to re-establish the practical pursuit of study on the human cadaver as the common privilege of the skilled physician, and was to establish his own name ineffaceably on the records of medicine.

Any comprehensive attempt to trace the real influences to which was due so great a step as a return to the practice of dissections of the human body, seems to me must be very defective if it failed to take into consideration the influence of such a man as Thaddeus. That he was able to impress himself in the way in which history records that he did, both upon the general public and upon the scholastic foundations of Bologna, shows a strength of character and a mastery of the peculiar conditions of the moment in the fields of science and philosophy which made him a master and an inspirer. If, as no one denies, the knowledge of the structure of the human body in a most minute degree is the foundation upon which all rational medicine and surgery must be built, then it is impossible to exaggerate the importance of the pivotal moment when, in the development of science, the human body began to be anatomized. Nor is any fault to be found with that custom which has crowned with the laurels of universal appreciation the names of those men who began and who continued anatomical study, who vulgarized the practice of dissection.

In my own investigations and reflections upon the conditions which led up to this happy renewal of scientific search into the composition of the body of man, it has seemed to me that writers have hitherto fallen short of tracing through to its ultimate source, the earlier spirit of enthusiasm for knowledge, of insight into the problems of disease, and of contempt for traditionary shackles, to the influence of which, as shown by the master, Taddeo, the later work of the pupil, Mondino, was in great measure due.

During the early years of the Renaissance, the glory of the University of Bologna was its school of medicine, and the glory of the school of medicine was its teaching of anatomy. As the

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restorer of anatomy, Mondino has ever received universal acclaim. Special interest must therefore attach to an attempt to search out somewhat more fully the underlying causes and influences which led this particular Bologna professor to this special work.

He was born at a time when everywhere throughout Italy free thought was being awakened, curiosity and speculative audacity were being encouraged, and the pursuit of learning new things had seized upon all classes. There is no figure in all history that represents this spirit more fully than Frederick II (1194-1250), King of Sicily and Emperor of the Holy Roman Empire, the indomitable, the learned, the law-giver, patron of the arts and sciences, warrior and statesman. For nearly fifty years he was the dominant figure in the life of Italy.

In his spirit, in his work, in his methods, we see illustrated and focalized that spirit which, diffused over the country as a whole, brought into the world, in the same generation, Giotto in art, Dante in literature, Thaddeus in medicine, and, in the succeeding generation, Boccaccio, Petrarch, Mondino. It was, then, as a part of the newly awakened freedom of thought and spirit of investigation into all learning that the pursuit of anatomical study naturally arranged itself, and in the fullness of time began to be practiced.

We are accustomed to think of the practice of dissection as having been recreated by Mondino, and at once, fully developed, springing into acceptance. The year 1315 is the generally accepted date for the first public anatomical demonstration upon a human body made by Mondino, and yet it is true that among the laws promulgated by Frederick II., more than seventy-five years before (A. D., 1231), was included a decree that a human body should be dissected at Salernum at least once in five years in the presence of the assembled physicians and surgeons of the kingdom, and that in the regulations established for admission to the practice of medicine and surgery in the kingdom it was decreed that no surgeon should be admitted to practice unless he should bring testimonials from the masters teaching in the medical faculty, that he was "learned in the anatomy of human bodies, and had become perfect in that part of medicine without which neither incisions could safely be made nor fractures cured." *

*"Nec tamen post completum quinquennium practicabit, nisi per integrum annum cum consilio experti medici practicetur. Magistri vero infra istud quinquennium libros authenticos tam Hippocratis quam Galeni in

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Salernum was not alone in its legalization of the dissection of human bodies before the first public work of Mondino, for, according to a document of the Maggiore Consiglio of Venice of 1308, it appears that there was a College of Medicine in Venice, which was even then authorized to dissect a body once every year.* Common experience tells us that the embodiment of such regulations into formal law would occur only after a considerable preceding period of discussion and, in this particular field, of clandestine practice. It is too much to ask us to believe that in all this period, from the date of the promulgation of Frederick's decree of 1231 to the first public demonstration by Mondino, at Bologna in 1315, the decree had been a dead letter and no human body had been anatomized. It is true there is not, as far as I am aware, any record of any such work, and commentators and historians of a later date have, without exception, accepted the view that none was done, and thereby heightened the halo assigned to Mondino as the one who ushered in a new era. Such a view seems to me to be incredible. Be that as it may, it is undeniable that at the beginning of the 14th century the idea of dissecting the human body was not a novel one; the importance of a knowledge of the intimate structure of the body had already been appreciated by divers ruling bodies, and specific regulations pre-

scholis doceant, tam in theorica quam in practica medicine, salubri etiam constitutione sancimus ut nullus chirurgicus ad practicam admittatur, nisi testimoniales litteras offerat magistrorum in medicinali facultate legentium quod per annum saltem in ea parte medicine studuerit, que chirurgie instruit facultatem, praesertim anatomiam humanorum corporum in scholis didiceri et sit in ea parte medicine perfectus, sine qua nec incisiones salubritur fieri poterunt, nec facte (fracte?) curari."

TRANSLATION.—Nor yet shall he practise after the five years' course has been completed unless he shall practise for a whole year with the advice of an experienced physician. Though the masters may have taught in the schools during that period of five years the authentic books of both Hippocrates and Galen, on theoretical as well as practical medicine, yet we order for the public good that no surgeon be admitted to practise unless he shall bring testimonials from the masters teaching in the medical faculty that he has studied at least one year in that part of medicine which develops skill in surgery, that he has learned in the schools especially the anatomy of human bodies, and has become perfect in that part of medicine without which neither incisions can safely be made, nor fractures cured.

Law of Frederick II (1212-52) requiring Study of Human Anatomy by Students of Surgery, promulgated A. D. 1231. *Vide:* Huillard-Breholles, Paris, 1854. Historica Diplomatica Frederici II; Tom. iv, pars I. Constitutiones Regni Siciliae, Liber III. Titulus XLVI, 3.

*Cavazzo: Antico Studio Bolognese, 1896. Page 153.

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scribing its practice had been enacted. It is more reasonable to believe that in the era immediately preceding that of Mondino human bodies were being opened and after a fashion anatomized. All that we know of the work of Mondino suggests that it was not a new enterprise in which he was a pioneer, but rather that he brought to an old practice a new enthusiasm and better methods, which, caught on the rising wave of interest in medical teaching at Bologna, and preserved by his own energy as a writer in the first original systematic treatise written since the time of Galen, created for him in subsequent uncritical times the reputation of being the Restorer of the practice of anatomizing the human body, the first one to demonstrate and teach such knowledge since the time of the Ptolemaic anatomists, Erasistratus and Herophilus.

The changes have been rung by medical historians upon a casual reference in Mondino's chapter on the uterus to the bodies of two women and one sow which he had dissected, as if these were the first and the only cadavers dissected by him. The context involves no such construction. He is enforcing a statement that the size of the uterus may vary, and to illustrate it remarks that "a woman whom I anatomized in the month of January last year, *vis.*, 1315 Anno Christi, had a larger uterus than one whom I anatomized in the month of March of the same year." And further, he says that "the uterus of a sow which I dissected in 1316 (the year in which he was writing) was a hundred times greater than any I have seen in the human female, for she was pregnant and contained thirteen pigs." These happen to be the only references to specific bodies that he makes in his treatise. But it is a far cry to wring out of these references the conclusion that these are the only dissections he made. It is quite true that if we incline to enshroud his work in a cloud of mystery and to figure it as an unprecedented awe-inspiring feature to break down the prejudices of the ages, it is easy to think of him as having timidly profaned the human body by his anatomizing zeal in but one or two instances. His own language, however, throughout his book is that of a man who was familiar with the differing conditions of the organs found in many different bodies; a man who was habitually dissecting.*

*Quotations from the work of Mundinus showing his familiarity with dissections. The leaf and line references are to the Dryander edition, Marburg, 1541.

"I do not consider separately the anatomy of component parts, because

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He was graduated in medicine in 1290, and the date 1306 is accepted as that when he assumed the professorial chair which he continued to occupy with such rare acceptability until his death twenty years later, in 1326. If, as seems most probable, under the inspiration of Taddeo the occasional dissection of a human body was a matter of routine at Bologna during the student days of Mondino, it is not difficult to imagine that as a student he gave himself to anatomical study with ardor and enthusiasm, in which he was favored not only by the special aptitude and energy of his own character, but by the popularity and influence of his master, by the high standing in the community of his own family, and by the general spirit of interest in new learning of every kind which had begun to move Italy.

Shortly after his death, the young Guy de Chauliac, of Montpellier, came to Bologna to study anatomy under the tuition of Mondino's successor, Bertrucius. When he wrote his own treatise, "La Grande Chirurgie," thirty years later, he prefaced it with an appreciation of the study of anatomy, saying, "It is necessary and useful to every physician to know first of all anatomy"; and that a knowledge of anatomy was to be acquired by two means; these are," he says, "the study of books, a means useful, indeed, but not sufficient to explain those things which can only be appreciated by the senses; the other, experimentally on the dead body, * * * according to the treatise of Mondinus, of Bologna, which he has written, and which [experimental anatomy on the cadaver] he [Mondinus] has done many times"—"*et ipsam*

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their anatomy does not appear clearly in the fresh subject, but rather in those macerated in water." (Leaf 2, lines 8-13.)

" . . . these differences are more noticeable in the cooked or perfectly dried body, and so you need not be concerned about them, and perhaps I will make an anatomy upon such a one at another time and will write what I shall observe with my own senses, as I have proposed from the beginning." (Leaf 60, lines 14-17.)

"What the members are to which these nerves come can not well be seen in such a dissection as this, but it should be liquefied with rain water, and this is not contemplated in the present body." (Leaf 60, lines 31-33.)

"After the veins you will note many muscles and many large and strong cords, the complete anatomy of which you will not endeavor to find in such a body, but in a body dried in the sun for three years, as I have demonstrated at another time; I also declared completely their number, and wrote the anatomy of the muscles of the arms, hands and feet in a lecture which I gave over the first, second, third and fourth subjects." (Leaf 61, lines 1-7.)

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fecit multitoties." (La Grande Chirurgie, ed. Nicaise, 1890, page 30). Two women and one sow would not merit the term "*multitoties,*" nor would the knowledge gained from such a limited field make a great anatomist!

Mondino himself uses the very same word, *multitotiens* in speaking about his own work. He is describing the hypogastric region, which he calls the "Sumen." Through this region, he says, pass to the surface certain veins which transmit fluid in the fœtus in utero, for which reason they are better studied in the unborn than in the fully developed, since they become useless upon full development, "As I have demonstrated *many times*" * * * *"Ego hoc modo multitotiens monstravi." (Anatomia Mundini, Impressit Argentine Martinus Flach,* MDXIII, Cap. II, Paragraph VI.)

We are helped to a better comprehension of the real nature and extent of Mondino's work by what may be learned of two of his assistants, to whom attaches a distinct element of romance. His prosector, at least during the later years of his work, was a certain Otto Agenius Lustrolanus. Otto is repeatedly referred to as Mondino's assistant by subsequent writers. With him was associated a remarkable girl, Alessandra Giliani, of Persiceto. (Persiceto was a populous district ten miles west of Bologna.) This young woman, when barely more than a child, manifested extraordinary interest in learning, and repairing to Bologna became a pupil of Mondino, first in philosophy, it is said, and later in anatomy. She became an enthusiast in the work of the dissecting-room; to facilitate this work she assumed a man's garb; she acquired great skill as a prosector. According to the chronicle, "She became most valuable to Mondino because she would cleanse most skillfully the smallest vein, the arteries, all ramifications of the vessels, without lacerating or dividing them, and to prepare them for demonstration she would fill them with various colored liquids, which, after having been driven into the vessels, would harden without destroying the vessels. Again, she would paint these same vessels to their minute branches so perfectly and color them so naturally, that, added to the wonderful explanations and teachings of the master, they brought him great fame and credit."

The authority for this statement is a quotation by Michele Medici (Compendio Storica della Scuola Anatomica di Bologna, 1857), from Alessandro Machiavelli (Effemeridi sacro-civili perpetua ecc, pp. 60-61), and from the Cronaca Persicetana of

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A LESSON IN ANATOMY IN THE XIV CENTURY.

Full-sized reproduction of a miniature placed at the beginning of a 14th Century manuscript copy of the Traité de l'Anatomie of Guy de Chauliac.

MS. Franç. 184, in the Library of the Faculty of Medicine of Montpellier; reproduced for the Nicaise edition of the *Chirurgie de Guy de Chauliac*, 1890.

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Orlandi. Medici in giving the quotation speaks doubtingly as to its credibility. Although it is more than probable that later writers have drawn largely on their imaginations for this description of the work of this young assistant of Mondino, it is well authenticated that Mondino did have as an assistant this Alessandra Giliani; that she was skillful and devoted; and that she survived Mondino but a very short time, but died in the very same year as her master. We know the very place where she was buried in front of the Madonna delle Lettere in the Church of San Pietro e Marcellino of the Hospital of Santa Maria di Mareto, where her associate, Agenio, mourning and inconsolable, placed a tablet with this inscription:

"D . O . M.
Vrceo . Contenti
Alexandræ . Galinæ . Pvellæ . Persicetanæ
Penicillo . Egregiæ . Ad . Anatomen . Exhibendam
Et . Insignissimi . Medici . Mundini . Lucii
Paucis . Comparandæ . Discipulæ . Cineres
Carnis . Hic . Expectant . Resurrectionem
Vixit . Ann . XIX . Obiit . Studio . Absunta
Die . XXVI . Martii . A . S . MCCCXXVI
Otto . Agenius . Lustrulanus . Ob . Eam . Demptam
Sui . Potiori . Parte . Spoliatus . Sodali . Eximiæ
Ac . De . Se . Optime . Meritæ . Inconsolabilis . M . P."

This inscription may be translated as follows:

"In this urn enclosed
Are the ashes of the body of
Alexandra Galiani, a maiden of Persiceto;
Skillful with her brush in anatomical demonstrations
And a disciple, equalled by few,
Of the most noted physician, Mundinus of Luzzi,
She awaits the resurrection.
She lived 19 years: She died consumed by her labors
March 26, in the year of grace 1326.
Otto Agenius Lustrulanus, by her taking away
Deprived of his better part, inconsolable for his companion,
Choice and deserving of the best from himself,
Has erected this tablet."

Later writers have surmised that Alessandra ruined her health by too close application to her work in the dissecting-room among diseased and pestiferous bodies.

Bologna expected Otto Agenius to carry on the work of his

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master, but such expectations were frustrated by the sudden death of Otto also, before he was thirty years of age.*

An instructive and interesting side-light on the conditions attending the study of practical anatomy in the days of Mondino may be found in a record,† still extant of a legal procedure, which occurred in Bologna in the year 1319, four years after Mondino had begun his public demonstrations, and at a time when Otto and Alessandra were doubtless enthusiastically working with him. According to the record, four students—three from Milan and one from Piacenza—were accused of having gone at night-time to the cemetery of the Church of San Barnaba, outside the San Felice gate, and to have sacrilegiously violated the grave in which was buried the body of a certain Pasino who had been hung on the gallows near the Ponte di Reno. It was charged that the students had taken up the body and carried it to the school in the parish of San Salvatore, near the pharmacy of Giacomo de Guido, where master Alberto (Zancari) was teaching. There were witnesses who affirmed that they had seen the body of Pasino in the school, and the students and others intent upon dissecting it. It was the sixth of December, when the arrests were made, but the final outcome of the trial is not stated.

Here certainly is the touch of human nature that makes us all akin. The medical student of the 14th century was very much like his fellow of the 19th century, and Mondino would have felt at home with Robert Knox and John Hunter and Astley Cooper.

It is not difficult for us of this day to put ourselves in sympathetic relations to these cadaver-lifting students of 600 years ago. We know what their mental processes were for we have all been through the same ourselves in our own day and generation. We know what their zeal must have been; what the intensity of their interest to see for themselves the things which Mondino

*Michele Medici (Compendio Storico della Scuola Anatomica di Bologna, 1857) quotes the following from Joseph Fernandus Guglielmus:

"Enim vero quid non profecisset Bononia ab Otto Agenio Lustrolanus quo Mondino assidui pro sectore utebatur, nisi sexto nondum vitæ suæ prætergresso lustro celere invidaque morte fuisset sublatus." That is to say: "What advantage indeed might not Bologna have had from Otto Agenius Lustrolanus, whom Mondino had used as an assiduous prosector, if he had not been taken away by a swift and lamentable death before he had completed the sixth lustrum of his life."

†Racconti del Mazzoni Toselli, Vol. III, p. 118, quoted by Michele Medici, *op. citat.*

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had described and Agenio had demonstrated. The tale gives us an insight into the enthusiasm and ardor for anatomical work that had been awakened in Bologna. One gets no suggestion of timidity or superstitious fear to profane the human body. It was evidently neither a new nor a rare thing which the body of this Pasino was to be subjected to.

In 1316, Mondino issued his book. He must have been then about fifty years of age. The exact year of his birth is unknown. If in 1290, however, he graduated in medicine, it is probable that we are not far wrong if we assign an age of twenty-five years for him at that time. If so, he may have been fifty-one when his work was completed. As an introduction to it he gives the reason why he has written it. He says: "A work upon any science or art—as saith Galen—is issued for three reasons: *First,* that one may satisfy his friends. *Second,* that he may exercise his best mental powers. *Third,* that he may be saved from the oblivion incident to old age. Therefore, moved by these three causes, I have proposed to my pupils to compose a certain work on Medicine.

"And because a knowledge of the parts to be subjected to medicine (which is the human body, and the names of its various divisions) is a part of medical science, as saith Averrhoes in his first chapter, in the section on the definition of medicine, for this reason among others I have set out to lay before you the knowledge of the parts of the human body which is derived from anatomy, not attempting to use a lofty style, but the rather that which is suitable to a manual procedure."

This, then, was the origin and object of the book. It was written out of the fullness of his experience and labors as a part of the general subject of medicine. Its copies could be multiplied by hand only, and it was one hundred and seventy-five years before the first copy of it, printed from movable type, was produced. For more than two hundred years it remained as the final authority in that department of medicine, '*'De omnibus humani corporis interioribus membris Anathomia.*"

No other great original anatomist arose to dispute the supremacy of Mondino, until Vesalius appeared in the sixteenth century, and modern anatomical research was started on its career.

It does not come within the scope of the present paper to consider at any length the book of Mondino nor its later wonderful vogue for so long a time; it is with the man himself rather that we have to do. The book must always remain of rare

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interest to the medical antiquary and historian, and especially to those particularly interested in the development of anatomical research. No translation of it into the English tongue has ever been published that I am aware of. The rude medieval Latin in which it is written makes its deciphering so difficult that the task would be undertaken only by an enthusiast. The manuscript of such a translation, however, is in my possession, executed years ago by my brother, Dr. James E. Pilcher, of the U. S. Army; the work having been assumed by him to relieve the tedium of garrison life in a western post. It ought to be published, but the favorable moment never seems to have presented itself. Its existence had almost been forgotten until inquiry, prompted by the present study of Mondino himself, has again brought it to memory.*

At the same time that Mondino was dissecting and teaching in Bologna, Henri de Mondeville was teaching anatomy and surgery at Montpellier, in France, and was writing a treatise on surgery, which occupied him during the period between 1306 and 1312. This treatise, able and interesting as it is, was supplanted in the next generation by that of De Chauliac, so that it remained buried in manuscripts until the close of the nineteenth century, when it was unearthed from the libraries in which it was preserved, by a German antiquary, and first published from a German press. (*"Die Chirurgie der Heinrich von Mondeville, zum ersten Male herausgegeben von Dr. J. L. Pagel,"* Berlin, A. Hirschwald, 1892.)†

This book of Mondeville is especially valuable to us in our present study, as giving some light on the real state of anatomical study at that date. Mondeville had studied at Bologna, following especially the lessons of Theodoric in surgery. Theodoric died in 1298. Mondeville had then returned to France and had begun his teaching at Montpellier, so that we know that his Bologna studies must have been previous to that date. We have seen that Mondino had taken his medical degree in 1290, so that it is unquestionable that Mondeville and Mondino were contemporaries as students of medicine in the school of Thaddeus and Theodoric.

*Correspondence in connection with the bibliography of Mundinus has brought out the existence of another manuscript translation into English of this book done at the instance of Dr. Howard A. Kelly, of Baltimore.

†A fine edition of the *Chirurgie de Mondeville,* translated into French, was published in 1893 under the auspices of the Ministry of Public Instruction of France, edited by E. Nicaise.

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When Mondeville returned to Montpellier and began to teach anatomy, he had to content himself with charts and models to illustrate his teaching, for public opinion in France was not such as to permit public dissections of the human body to be made then, nor for many years thereafter (in France the first dissections of the human body were done at Montpellier in 1376), for when his successor, De Chauliac, would learn the structure of the human body, he, too, had to repair to Bologna for the purpose. The manuscripts of Mondeville's chapters on Anatomy indicate that there were from twelve to nineteen separate charts used by him. The designs* are not reproduced in these manuscripts, but the legends have been preserved, so that we may have a pretty clear idea what they represented. I will refer to but two of these.

Selecting two, No. 3 and No. 9, which are fairly representative the legend of No. 3 is as follows:

"Figure of a man in whom, by an opening of the belly and of the chest, one sees the veins and the large arteries arise in the liver and the heart and go to the distant parts of the body, as the nails and the hair." Page 20.

No. 9 reads: *"Figure of a man cleft open in front from the middle of the forehead to the anus, that is to say through the middle of the nose, of the mouth and of the tongue; in the interior appear whole the knuckle of the throat, the food and the air ducts, the heart, the lungs and the diaphragm, the stomach and the epiploon, the liver, the spleen and the intestine, according to the manner in which they are grouped and exist in the living man, as accurately as possible."* Page 37.

Who made the first sketches for these plates, who wrote these legends, we do not know; certainly someone who had looked into the opened cadaver and described what he there saw. It may possibly have been Mondino himself; more likely the masters by whom both Mondino and Mondeville were first instructed as to the mysteries of the interior structure of the human body, *"De omnibus humani corporis interioribus membris Anathomia."*

The point of importance in connection with the present theme

*One of the manuscripts contains fourteen miniatures which show only the general subject. Because of their minuteness they represent no detail. The first one shows a surgeon standing, holding in his hand a razor with which he is making in the different parts of a man who stands naked before him different incisions, according to the variations of the parts, and according to the teaching given in the text which follows. NICAISE. *Chirurgie de Maitre Henri de Mondeville.* Trad. Française, Paris, 1893.

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LA SCUOLA DI ROLANDINO PASSAGGERI
dalla sua tomba nell' antico cimitero di S. Domenico, ora piazza Galileo.
From a photograph.

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is that the making of such charts adds an increased probability to the truth of the conclusion of the writer that there were dissectors before Mondino.

As further illustrative of the energetic quality of Mondino's mind, his readiness to seize upon and make the most of the possibilities of the moment, there has been preserved to us a notable evidence in the sculptured sepulchral tablet, which he erected over the tomb of his uncle, providing, at the same time, that it should mark his own final resting place.

The custom of honoring the professors in Bologna by rich tombs had long existed.* For such monuments grand pyramidal structures had prevailed during the thirteenth century, and magnificent examples of these still remain in the old cemeteries of San Francisco and San Domenico. When, however, the jurist, Rolandino Passaggeri, died in the year 1300, for his monument a new style was devised. The remains were placed in a huge marble sarcophagus, on the side of which was a sculpture in high relief representing the professor in the act of giving a lesson to four of his pupils who are seated before him upon very low benches holding their books supported upon small desks. The benches and desks are roughly made and of primitive form, and the whole sculpture is rather rude and archaic. It contains, however, very clearly and distinctly, the idea of preserving the memory of the teacher doing his life work with his pupils about him. (See reproduction of photograph of tomb: Plate 9.)

Eighteen years later, Liuccio di Luzzi, the uncle of Mondino, died. This uncle was a laureate of the medical school in 1281; in 1292, he became professor of physics in the University, and in 1307, he began to teach medicine, holding a chair both in the colleges of philosophy and medicine. His father, Albizzo di Luzzi, is believed to have come from Florence, and the records show that as early as 1270 he had established, in company with a certain Bartolommeo Raineri, a pharmacy in Bologna. It later passed into the entire control of the Mondini and thereafter became the Spezieria del Mondino. It had for its ensign a doctor, and was maintained as a drug-shop until the beginning of the last century.†

This pharmacy was near the Church of San Martino dei

*Corrado Ricci. Monumenti sepolcrali de lettori dello studio bolognese. Bologna, 1888.

Cavazza. Antico Studio Bolognese, 1876, p. 191.

†Michele Medici. *Op. citat.*

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Caccianemici, in the Piazza del Aurora, in the quarter of the Porta Nuova, in which the School of Medicine was situated.*

Liuccio, with his brother Nerino here continued to exercise the art of pharmacy, a vocation which in those days was evidently not inconsistent with the position of a professor of physics and of medicine in the University. It was among such surroundings that Mondino spent his boyhood and grew up into the medical school which was near by. His uncle Liuccio was, in his eyes. a great man. Upon his shoulders the mantle of Taddeo had fallen. Through his influence and inspiration his own career as an anatomist had been developed. A tomb befitting his merits it should be the duty and privilege of the nephew to erect, one which Mondino himself might share when "inevitabile fatum" should have overtaken him also.

The Passaggeri *bas relief* had doubtless been the subject of much comment among the scholars of the University, and the idea which it contained appealed to the peculiar quality of Mondino's mind, which rendered it ever open to novelty and merit. Such a tablet should commemorate the virtues and attainments of his uncle, and should mark his own final resting place. To the sculptor Roso, of Parma, was given the commission, and the result is one of the most perfect and characteristic sepulchral bas reliefs of that period. (See plate 10.) Seated in a massive professorial chair, surmounted by an imposing canopy, with a large folio resting upon a reading desk before him, the professor is represented as in the act of commenting upon the text. It is possibly a copy of Galen, or, more likely, of Averrhoes or other of the Arabian writers that was before him. With outstretched hand he is enforcing his comment. The fur-bordered cap and the hooded robe that mark his high position in the University are distinctly delineated, and the features—though now after six hundred years they show the corroding effects of time—we may well believe presented a marked likeness of the man whose memory the sculpture was to preserve.

The professor is represented as of heroic size compared with his pupils that sit before him; an attempt to represent in physical proportion the mental dissimilarity that was supposed to exist,† a custom which was common among the painters of that age in their representations of the Saviour and the Saints as compared with

*Cavazza. *Op. citat.*, p. 12.

†The Bertalia tablet (MCCCXXVIII) is herewith reproduced. (See Plate 11), as a still more striking example of this custom.

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THE MUNDINUS TABLET IN THE PORTICO OF THE CHURCH OF SAN VITALE IN BOLOGNA.
(From a photograph of the replica in the possession of Dr. L. S. Pilcher, of Brooklyn, N. Y.)

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LA SCUOLA DI MICHELE DA BERTALIA LETTORE DI MEDICINA.
Dal suo sepolcro già in S. Francesco ed ora nel Museo Civico.
From a photograph.

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their followers. Seated on benches, in front of the professor are the scholars, clothed in long togas, the head covered by a kind of turban. Before each is a reading desk upon which lies a great folio, which each pupil is intently regarding. By one of these desks stands one who is apparently an assistant or demonstrator, who is pointing out to a perplexed student the matter which the professor is expounding; while in the distance is seen approaching one, who by his manner of dress is evidently of a different grade from the pupils, who is bringing in an armful of books.

Thus we see in this tablet the professor, his assistant, the pupils, and the beadle, all represented. The costume of the age and place is preserved to us, and a most realistic presentation of the medieval University classroom is given to us.

This tablet still remains affixed to the wall of the portico of the Church of San Vitale in Bologna, marking the spot where the remains of both Liuccio and Mondino di Luzzi were buried. With but one other exception, all other sepulchral tablets of its class in and about Bologna have been removed from the place in which they were originally set up, and assembled in the halls of the Museo Civico, a kind of desecration which does violence to one's sense of sanctity and propriety. The churches of San Domenico and of San Martino, the Cathedral and the Cloister of San Giacomo degli Ermitani have all been despoiled of these sculptures which in their original setting would ever have had the highest historical interest, and they have been made simply specimens in a civic museum! Fortunately, thus far, the Mondino tablet has escaped the spoiler.

One April afternoon I stood before this tablet and mused upon its significance and memories. The dim light of the church portico was quite in keeping with the dimness and vagueness of our knowledge of the men to perpetuate whose memories it was erected 600 years ago. Here, however, was something tangible that brought me directly into contact with an energetic mastermind, one who was the chiefest figure in the domain of medicine over a period of two hundred years, who was the morning star of its renaissance. This marble he had planned to perpetuate the memory of one whom he had revered, as well as to mark his own final resting place; his own hands had been upon it; with loving solicitude he had placed it in the portico of this ancient church in the quarter of the Porta Nova among the men whom he had

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taught and who loved him. Certainly this was a shrine to which the medical pilgrim might well bend his steps, and before which he might bow in reverence.

INSCRIPTION IN THE WALL BELOW THE MUNDINUS TABLET IN THE PORTICO OF THE CHURCH OF SAN VITALE

Below the bas relief is a plain marble slab affixed to the portico wall, containing the following inscriptions:

"Gloria Nature Medica Virtute Leuci,
Cujus Erant Cure Morientes Redere Luci
Invidia Fati Recubas Jam Nomen Adeptus
Compar Ypocrati Sublimi Marmore Septus
Annis Millenis Tercentum Bisque Novenis
Dum Sol Terdemis Augustum Torquet Habenis."

which may be translated into English thus:

"To the innate glory and medical worth of Leucius,
By whose skill the dying were restored to life;
To an hateful fate thou dost submit.
Now thy name, esteemed equal to that of the renowned
Hippocrates, is embalmed in marble. August
30, One thousand, three hundred and eighteen years."

Below this is a second inscription containing the words:

"Sepulchrum Magistrorum Leucii et Mondini
de Luccis et eorum Heredum."

that is to say:

"The sepulchre of Masters Leuccius and Mondinus de
Lucci and their Posterity."

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The tablet presents to the left of the first inscription the sculptured outline of an open book, the pages of which bear the words, *"Vita Brevis Ars Vero Longa."* On the right of the inscription, in low relief, is a shield bearing two fishes, presumably the special insignia of the Luzzi family (Luzzi = Pikes).

At the time of my visit to the Church of San Vitale, the thought occurred to me that it might be possible to obtain permission to make a plaster cast of this sepulchral tablet and transport it to my own home; a trophy that would always be a source of pleasure to me and possibly to other students of medical history. I was able to enlist the active co-operation of Mr. Frank, of the Hotel Brun, through whom the necessary permission of the civic authorities was secured, the only stipulation being that I should have a second cast made which should be deposited in the Museo Civico. This I was the more glad to accede to, since possibly the presence of such a cast in that museum might tend to lessen the probability of the original itself being transferred from the place where Mondino himself had put it, to the miscellaneous walls of a public and heterogeneous collection. An artist in plaster was at once secured and the contract made, and in due time the completed cast reached me and found its present resting place in my own library.

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SOME LESSONS FROM THE LIFE OF MAJOR WALTER REED.*

By Howard A. Kelly, M.D.

Baltimore, Md.

WALTER REED'S sojourn at the King's County Hospital occurred at a most important period of his life's development. The transition from boy to man is always a formative epoch, and in Reed's case its influence was enhanced by its coincidence with his first knowledge of large cities and his first personal experience of the misery and vice which exist in them. His letters during this period show how deeply he was affected by his environment and how largely it contributed to direct his ambition into the highest of all channels, the desire to be of service in the cause of humanity. I can say with confidence that the seeds of Walter Reed's ultimate success were sown amidst the mingled delights and disenchantments of his New York and Brooklyn experiences.

Under the proper limitations of this occasion it is impossible for me to speak of Reed's work in detail; I shall, therefore, employ my time in touching upon a few of the salient points in his life and labors, from which we may draw some profitable lessons.

There is nothing, perhaps, which strikes us so forcibly in all Reed's career as his quiet unmurmuring acceptance of circumstances with his tacit refusal to allow untoward conditions or environment to interfere with the attainment of his goal. From his earliest youth his most ardent wish was to pursue some scientific research with the object of relieving in some measure the suffering of humanity. But in what did his preparation for this work consist? An elaborate training, first in a general college curriculum and then in science and medicine, extending in all over a number of years, would usually be regarded as indispensable to success; but Reed's college career was limited to two years, all told, one in letters and one in medicine. A detailed knowledge and observation of scientific methods, with some experience of them in foreign universities is considered almost essential to a scientist, but Reed, although he had the advantage of hospital and dispensary work in his own country, never saw a foreign university. Uninterrupted pursuit of the

*Address to the Kings County Hospital Alumni Association, November 21, 1906.

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end in view and pecuniary resources calculated to smooth away every difficulty are usually regarded as nothing more than the due of the scientific worker; but when Reed, after years of drudgery, was at last able to engage in his long-coveted researches, he was so far from commanding his whole time that he could bestow upon them only the hours spared from the homely duties of an examining surgeon of recruits. Surely, there can be no more striking example of the fact that success lies in the man rather than in the means at his disposal.

To the cursory observer it might appear that eighteen years spent upon the Western frontier, in the commonplace duties of a Post doctor, was a deplorable waste of the abilities and energies which finally accomplished such great things. But these years of non-recognition, during which his talents might appear to have been buried in a napkin, were the very preparation which, more than all else, fitted Reed for the high service for which he was designed. His long and arduous labors in a stern school, where there were none to advise or help, taught him to rely solely upon his own judgment and to be independent of various accessories usually deemed indispensable to success. He learned to mark out his own line, untrammeled in his judgment by the traditions or the trend of opinion in the medical profession at large.

Before going to Cuba, Reed had been much interested in some observations made by Dr. Henry R. Carter, of the United States Marine Hospital Service, and was struck by the fact that the interval elapsing between primary and secondary cases of yellow fever was strongly suggestive of an intermediate host. Soon after Reed arrived at Quemados, he witnessed a small epidemic of yellow fever at a little neighboring town, called Pinar del Rio, and what he saw there convinced him that there was no truth whatever in the doctrine of fomites, so long accepted. These two things induced him to believe that there was something in the theory of the transmission of yellow fever by means of the mosquito as suggested by Finlay. Only a mind trained to independent thought and accustomed to rely upon its own resources, however, could have gone so far counter to the trend of opinion in the profession at that time. The whole scientific world was at that time occupied with the search for the specific organism causing yellow fever, and had Dr. Reed followed the line of thought prescribed by the best minds we should probably be no better off to-day than we were when he went to Cuba.

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As his friend Dr. McCaw says: "Too much reverence for accepted teaching and too little experience in grappling with difficulties unassisted and they (Reed's experiments) would never have been."

One particular phase of Reed's life upon which I must say a word is his friendships, for it is one in which he showed himself peculiarly strong. It is a matter of common observations that a man cannot attain eminence without exciting such an amount of jealousy and ill-feeling as to alienate his acquaintances and often his friends. Certainly nothing could be farther from the the truth in the case of Walter Reed. Nothing in his life is more striking than the lasting nature of his friendship and the fact that whatever distinction fell to his lot was a source of pleasure and pride to his friends and associates, and nothing speaks .more strongly to his sweetness of his nature. I have with me to-night a letter from him to his good friend, Dr. L. O. Howard, of the United States Bureau of Entomology, in which his warmth of heart and interest in others is plainly shown.

"COLUMBIA BARRACKS,
QUEMADOS, CUBA, January 13, 1900.

DEAR MR. HOWARD: I am in receipt of yours of January 5, and thank you very much for the card containing Dr. Wolfert's suggestion—I turned the card over to the Chief Surgeon yesterday. I enclose a copy of the order relating to protection against mosquitoes. Of course, you have already heard from Dr. Sternberg of our complete success in repeating our former observations. The mosquito theory for the propagation of yellow fever is no longer a *theory*, but a *well-established fact*. Isn't it enough to make a fellow feel happy? Anopheles and Culex are a gay old pair! What havoc they have wrought on our species during the last three centuries! But with "Howard and kerosene" we are going to knock them over!

With best wishes,
Sincerely yours,
WALTER REED.

P. S.—Major J. R. Kean, Surgeon, U. S. A., was the Acting Chief Surgeon of the Division of Cuba at the time this order was published, and it was he who drew it up and recommended it to General Wood. He should have credit for it."

I ought not to pass on without a word in regard to Dr. Howard's own interest in yellow fever, which he expresses in the following extract from a letter recently written to me.

"Very few people—possibly none outside of the medical profession are in position to appreciate the tremendous effect of Dr. Reed's work and

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the careful manner in which it was performed, with the genius of the man himself, better than I. As you may know, I was closely in touch with the work from its inception. Doctor Lazear called on me and talked mosquitoes with me before he went to Cuba. Reed and Carroll came frequently to my office and studied mosquitoes—one afternoon Coquillett and I gave them regular class work on the characters used in distinguishing the different species. After Reed achieved his first results he wrote me a long letter, which I shall always preserve, in which he described his work and in which his enthusiasm glowed. One of his expressions I remember was, 'And now, thanks to Howard and kerosene we have yellow fever under control.' I shall always think with peculiar gratification that it was my story of Reed and his work at that dinner at Graham Bell's that started the resolution for the Reed memorial. It was an interesting and eventful dinner. Some of the best men of the country were there, and my friend, James Fletcher, from Canada. Although it was a large dinner, as always happens at Dr. Bell's the conversation after dinner was directed by him into single channels, and among other people of whom he asked questions, he asked me to tell the story of Reed. I have always hoped that it was the enthusiastic way in which I stated the subject that started the strong feeling among those present, most of whom knew only the newspaper comments.

"Reed was a great man, and a fine man, and one of the most delightful, sincere, and clean personalities I ever met."

With the two men associated with him in the yellow fever work Dr. Reed formed the most earnest friendships. One of them, Dr. Lazear, laid down his life for the cause he served. But the other, Dr. James Carroll, is still among us and is, indeed, the sole survivor of that brilliant trio. I am sure you will not think I wander from the subject in hand if I say a few words in regard to him and his work, for if it is right and honorable that we should pay tribute to the dead, surely, it is no less so that we should warm the hearts of the living with expressions of affection and esteem.

The importance of Dr. Carroll's work on the Yellow Fever Commission cannot be over-estimated. It has often been remarked that its experiments were remarkable not only for clearness and accuracy, but for rapidity of completion. This is owing in large part to Dr. Carroll's untiring exertions. On two occasions it was necessary for Dr. Reed to return to the United States, and during his absence the work remained in charge of Dr. Carroll, the next in command. Dr. Carroll fulfilled his responsibilities, not by simply seeing that the experiment did not suffer on account of Dr. Reed's absence, but by conducting them along the lines laid down with that zealous enthusiasm which was the happy harbinger of the successful issue. Reed's first

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absence in this country took place just after it was determined to accept the mosquito theory as a working hypothesis; on his return he found the preliminary series of experiments completed and ready for publication. Again, when Reed returned home in February, 1901, Carroll remained behind until March, in order to investigate the changes taking place in the blood and urine during yellow fever. Most important of all, it was Carroll who returned to Cuba, in August, 1901, to carry the work of the Commission to a close; and Carroll who established the fact that the specific germ is, almost to a certainty, ultra-microscopic, and therefore not to be discovered, *in propria persona*, by any means at our command. Finally, what shall we say to the fact that Dr. Carroll was the first subject of an attack of experimental yellow fever? As soon as the members of the Commission determined upon the necessity for human experimentation, they resolved that the initial experiment must be made on one of themselves, and Carroll volunteered to be the subject of it. How Christian, and how nobly different from the maxim of the ancients, *"Experimentia fiat anima vili,"* meaning, for the most part, a poor slave! Reed's name needs no effort of ours to promote its just mede of praise; his claims are secure. Were he with us now, as we gather round this board, we would crown him with laurels, but, alas, all we can do is to marvel at his achievements and admire the beauty of his character. By what more gracious act could we express our love and gratitude than by honoring the man who stood closest to him, who proved himself, indeed, a right hand, and who will be known wherever the story is told, as an essential factor in the work.

"Patriots have toil'd, and in their country's cause
Bled nobly; and their deeds, as they deserve,
Received proud recompense. * * *
But fairer wreaths are due, tho' never paid,
To those who, posted at the shrine of truth,
Have fallen in her defence. * * *
* * * Their noblest blood is shed.
In confirmation of the noblest claim,
Our claim to feed upon immortal truth.
To walk with God, to be divinely free,
To soar, and to anticipate the skies.
Yet few remember them! * * *
* * * With their names
No bard embalms and sanctifies his song;
And history, so warm on meaner themes,
Is cold on this."

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And now, lest our enthusiasm evaporate in words and leave us spiritually impoverished, let us, here and now, in the place where our departed colleague labored, resolve, ourselves to profit by the lessons of his life. We have the same, or greater opportunities than he to open rich mines of service, and, indeed, for an occasion we need not look beyond the walls of this foundation. His life teaches one great lesson of humanity: a spirit of kindliness to the least, as well as to the greatest. Physicians, surgeons, and residents, nurses as well, carry this spirit into all your dealing with the poor under your care. Be uniformly kind and considerate from your heart and you will have achieved one of the greatest elements of success.

Let the trustees here look to the harmony of spiritual relationship, as well as to the efficiency of the staffs appointed by them. Give your men good assistants, give them the aids they want, and let them train those they have chosen to take their places when they become vacant; not with jealousy, but with affectionate interest in the growing reputation of your helpers. Give the residents a chance to do some original work—let them operate freely, when you can trust them to do so. Do less active work yourselves and more study; continue to discipline yourselves in the battle of life, and remember that when you relax, you inevitably fall back.

Is there anyone of you who holds several appointments which keep him busy operating all the time? It is an iniquity. Quit it, and let the younger men have a chance. Retain one, or at the most two, and be generous even with these to your assistants and residents. Remember you hold a position of trust, not to exploit yourselves, but to train men to follow after you, to hold you in loving remembrance, and, from the vantage of your attainments, to see farther and do better work.

Young men, you have many discouragements, but you would not be worth a fig if you had no battles to fight. Keep ever a kindly spirit in all relations of life and stick to your post hopefully. Make an effort to do some work which will live after you are gone elsewhere; start a new medical society; get a big working library, if you have not one already; it is an essential. If you are compelled to do drudgery and waste precious time in the mere manual exercise of writing up histories and operations, go to your trustees and ask them for one or more stenographers, and when you have obtained these, start a good card index of your diseases, operations, and complications. As soon as this is

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under way, go to work and publish any results you may have to give to the world; don't wait to make a startling discovery, but put out little papers first and big ones as time does on.

You work best for self, young men, when you forget self in complete unselfishness, and work because it is right and honorable that you should do your best in the sight of God and man. I think wherever my name may chance to be known, it is also known that I stand for a definite living Christian faith; therefore, I beseech you, finally, to make real that belief which we so widely advertise on our coinage, "In God we trust." I beseech you, give, at least, that measure of reality to your Christian faith which the Musselman, the Chinaman, and the Hindoo invariably accord to theirs. If you do even so much as this, I have hopes that this occasion will mark a new era, a red-letter day for your hospital, for your community, and for yourselves.

LEONARDO DA VINCI AND VESALIUS: A REVIEW.*

By J. Playfair McMurrich, Ph.D.,

Professor of Anatomy in the University of Michigan, Ann Arbor, Mich.

IT has long been accepted that the founder of modern anatomy was Andreas Vesalius, and that, in anatomy, the awakening of the necessity for exact personal observation dates from the publication of his great work, *De fabrica corporis humani,* in 1543. Within the last four years, however, attempts have been made to disenthrone Vesalius from his proud position, to expose him as a gigantic plagiarist, and to establish in his place the great Florentine artist, Leonardo da Vinci.

Such attempts have naturally been provocative of further inquiry into the grounds upon which they were based, with the result that we now possess a much more accurate appreciation of the position to be assigned to both Vesalius and Leonardo in the history of anatomy.

The indictments against Vesalius are two in number, the most sweeping being that of Jackschath (1), who maintains that Leonardo wrote a work on human anatomy with abundant illus-

*Read before the Catholepistemiad Club of the University of Michigan.

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trations, a work, however, which is "not to be found complete in the manuscripts of the painter preserved in Milan, London, Paris, but * * * has been fortunately preserved for us in the *Fabrica* of Vesalius," meaning thereby that Vesalius' *Fabrica* is a wholesale plagiarism of Leonardo's work. The second indictment, also of plagiarism, is by von Töply (2), who claims that Vesalius borrowed without acknowledgment certain figures published by Estienne (Stephanus, 1539).

We may consider briefly, first of all, the second, lesser charge which has been discussed by Roth (3), who finds that instead of Vesalius plagiarizing Estienne, the matter is really the reverse. Von Töply's case is based principally upon the occurrence in the work of Estienne of a series of four figures representing the skeleton from: first, the anterior surface; second, the left side; third, the dorsal surface; and fourth, the right side; upon the facts that a hyoid, malleus and incus are placed at the feet of figure 1, and that that same figure stands beside a tree-trunk to which is attached a plate bearing the name of the engraver, Jollat, and the date 1532. Vesalius has, in his *Tabulae Anatomicae,* published in 1538, a series of three skeletons, representing an anterior, a posterior, and a lateral view (the right side); in the lateral view given in the *Fabrica* (but not in that of the *Tabulae*) are represented, in addition to the main figure, a hyoid, malleus and incus; and in the dorsal view of the *Tabulae* the figure stands beside a tree-trunk, against which leans a shield. The series of Vesalius, therefore, shows many similarities to that of Estienne, and the date of Estienne's fourth figure (1532) proves that his series was developed long before that of Vesalius.

The similarities certainly give ground for suspecting plagiarism on the part of one author or another, and if the date of the Jollat figure be accepted as good evidence, the burden of exoneration lies with Vesalius Roth assumes this burden and completely turns the tables. In the first place, it must be noted that the first portion of Estienne's work was printed in 1539, but the entire work did not appear until 1545, emendations of the part printed earlier seeming to have been made in the interval; and, further, that a second edition appeared in French in 1546. The 1545 edition does not contain the Estienne skeleton series, but only an anterior and posterior view; the lateral views appear first in the 1546 edition. Estienne's series, then, was not developd until three years after the publication of the *Fabrica* and until eight years after the publication of the *Tabulae,* and, further-

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more, it may be noted that one of the missing figures is that which bears Jollat's signature and the date 1532. But this is not all. Between Estienne's anterior and posterior views on the one hand (one of which is by de la Rivière), and the lateral views on the other (one of which is by Jollat) there are marked differences in the drawing. The former, for instance, show oblique shading of the long bones, the latter transverse; and the illumination of the latter is sometimes from the right and sometimes from the left. Estienne's series, then, is evidently a composite, while Vesalius' is uniform throughout, the shading being more perfect and the illumination in all the figures being from the right.

Here, then, are two important points both of which tell strongly in favor of Versalius, and indicate that the skeleton series of Vesalius was quite independent of that of Estienne. And there is still more. The small bones added to the lateral view of the *Fabrica* are a hyoid, a malleus and an incus, but those at the feet of Estienne's anterior view are not the same, as von Töply states, but instead of a malleus and incus there are two laryngeal cartilages, some tracheal cartilages and the semilunar cartilages of the knee-joint, these last structures having been discovered by Vesalius, although Sylvius later claimed priority. Roth maintains that Vesalius' artery and vein figures of the *Tabulae* appear in Estienne's 1545 edition poorly reproduced, and that the Jollat figure of the skeleton, though earlier than the corresponding figure by Vesalius, was quite distinct from it and was introduced by Estienne into his 1546 edition, just as other figures with the same signature were introduced, two of which were also used by Berengario da Carpi (1470-1530).

The date of the Jollat figure does not, then, indicate the date of Estienne's skeleton series, and there seems little reason for believing that Vesalius was indebted to this figure for his lateral view, the two figures differing so markedly, both artistically and anatomically. It being out of court, there remains only the question whether Estienne's artist, de la Rivière, borrowed from Vesalius the anterior and posterior views of the skeleton or *vice versa.* The fact that Vesalius' figures were published in 1538 in the *Tabulae Anatomicae,* while Estienne's were not printed until 1539, directs suspicion to Estienne, and the suspicion increases when the heterogeneity of Estienne's series is compared with the homogeneity of that of Vesalius, and when the matter of the knee-joint menisci is taken into consideration. De la Rivière's

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tree-trunk, with the attached initialed plate, may well be, as Roth supposes, an imitation of the tree-trunk of Vesalius with the shield leaning against it, and from all the evidence adduced, only a part of which is presented here, one must be strongly inclined towards Roth's conclusion that "Estienne's engraver and artist, de la Rivière, in the preparation of the anterior and posterior views of the skeleton, had before his eyes Vesalius' *Tabulae Anatomicae* of 1538."

Turning now to the more important charge of Jackschath, that the *Fabrica* of Vesalius is a wholesale plagiarism of a lost treatise on anatomy by Leonardo da Vinci, it may be stated at once, that while the accusation must be regarded as unsupported by sufficient evidence, to say the least, yet its author has performed a good service in awakening the attention of anatomists to the remarkable and precocious investigations carried on by Leonardo in anatomy, and for this we may be grateful even while deploring the extreme position to which his enthusiasm for Leonardo has carried him.

To most of us Leonardo is familiar as a painter, the creator of "The Last Supper" in the refectory of the Convent of Santa Maria delle Grazie, in Milan, and of the "Mona Lisa" in the Louvre. His activities extended far beyond this, however, for as the editors of an English edition of Vasari's "Lives" say of him: "He was painter, sculptor, architect, engineer, musician, philosopher, chemist, botanist and geologist" (and, they ought to have added, anatomist). It would be interesting to detail some of his achievements in the fields of activity mentioned, for in many of them he surpassed all his predecessors and added to the knowledge of his time many valuable discoveries and suggestions. But it is to his anatomical investigations that our attention must be confined.

Born in 1452 at the Castle Vinci, in the valley of the Arno, about midway between Pisa and Florence, Leonardo showed in his boyhood considerable talent in drawing and modeling in clay, and about 1470 he was placed with his father's friend, Andrea Verrocchio, that he might receive instruction in these arts. Verrocchio owes his reputation rather to his work in bronze than to his painting, his equestrian statue of the Condittiere Bartolommeo Colleoni in Venice being one of the most splendid examples of that form of art which we possess. He is said to have made casts of limbs for the purpose of study, and it may be presumed that from him Leonardo received a stimulus toward a more

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thorough knowledge of the structure of the human body. The native force, however, which compelled Leonardo to anatomical studies was inherent in the man; it was his unquenchable desire to prove all things. "Experience," he says, "is the interpreter between artistic nature and man," and long before Bacon, as Raab (4) points out, he made use of the inductive method. At what time and under what circumstances Leonardo began his anatomical studies in unknown.

About 1482, according to Richter (5), he left Florence for Milan, to take service under Ludovico Sforza, and it seems to be unquestionable that while there he carried on anatomical studies, for in one of his manuscripts is the memorandum: "On April 2, 1489, the book entitled 'On the Human Body,'" a statement usually interpreted as meaning that he began a book with that title on that day. Whether he began his anatomical studies while still in Florence is unknown, but it seems certain that they were principally carried on in Milan. Though conducted on a somewhat extensive scale they were planned on an even more extensive one, for from one of his manuscripts we learn that he investigated every part twice in order to learn their difference and regarded repeated dissections as absolutely necessary. Three are necessary, he says, to obtain a knowledge of the arteries and veins, three for the anatomy of the integuments, three for the nerves, muscles and ligaments, three for the bones and cartilages, three for the bones, which must be sawed in pieces to determine which are hollow, which spongy, and which contain marrow, etc. Then dissections of three female bodies are necessary. He told Cardinal Louis of Aragon, in 1516, that he had dissected more than thirty bodies, male and female, of various ages. Speaking of his projected book he says: "This work must begin with conception "in the body of the mother. The nature of the uterus is to be "described, how the fœtus exists therein, in what degree of "development it leaves it, and how it lives and is nourished. Its "growth in different intervals is to be investigated, the causes "which determine its birth and the causes why it is frequently "born too soon. Then describe what parts, after the child is born, "grow more than others, and give the proportion of a one year "old child. Then describe the adult male and the adult female "and give their proportions, further the nature of their internal "constitution, their colors and their physiognomies. Then "describe how the body is composed, of veins, nerves, muscles, "bones. This thou wilt do in the last book. Then represent in

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"four views four universal emotions of man, that is to say, joy, "with the different kinds of laughter, weeping in various manners, "quarreling, with different movements of the death stroke, fright, "fear, fierceness, cruelty, murder and the like. Then draw a "figure at work pulling, pushing, carrying, standing and the like. "Then describe the attitudes and the movements. Then perspec- "tive, the functions of the eye and ear and brain (I will also speak "of music) and describe all other senses. Then describe the "nature of the senses. We shall represent the actual figure of "man in — figures, that is to say from the front, showing the "height and the form of the bones, the second figure seen in "profile will show the depth of all parts. The third will represent "the bones from behind. Then we shall make three other figures "in similar views, with the bones sawed in parts so that their "thickness and cavities may be seen. Three other figures of the "complete bones and the nerves which come from the spinal "thickness and cavities may be seen. Thre other figures of the "the bones and veins and where they are distributed, then three "with muscles and three with skin and showing proportions, and "three of the female to show the uterus and the venæ menstruales "which pass to the breast." In another place he says: "Thou hast "also to figure in thine anatomy the development of parts from "the creation of the man to his death, and after his death, what "bones are first destroyed and what persist longer; also the condi- "tion of extreme thinness and extreme stoutness are to be "represented" (6).

Whether the book thus comprehensively projected was ever completed is more than doubtful. Vasari (7) says that he "filled a book with drawings in red crayon outlined with a pen, all the copies made with the utmost care (from bodies) dissected by his own hand. In this book he set forth the entire structure, arrangement and disposition of the bones, to which he afterward added all the nerves, in their due order, and next supplied the muscles. Of each separate part he wrote an explanation in rude characters written backwards and with the left hand, so that whoever is not practised in writing, cannot understand them, since they are only to be read with a mirror. Of these anatomical drawings of the human form a great part is now in possession of Francesco da Melzo, a Milanese gentleman * * * who sets great store by these drawings and treasures them as relics."

This description tallies admirably with the manuscripts of Leonardo now in the Royal Library at Windsor, but these cannot

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be regarded as forming a complete treatise on anatomy. Leonardo says himself that he hoped to complete his anatomy in the spring of 1510, but it appears that he was still pursuing his anatomical studies in 1514 in Rome, when, on account of his having practiced dissection, he was denied admission to the hospital by Pope Leo X. It seems from this that his expectations were not fulfilled, and in the succeeding years he was with Francis I of France in the north of Italy and later in 1516 accompanied him to France, and took up his residence at the Château Cloux, near Amboise, where he died in 1519. Richter believes that his residence in France must have been more or less that of an exile, France being at that time far behind Italy in culture, and it seems improbable that he would have, in a French provincial town, the opportunities necessary for the completion of his anatomical studies.

But the manuscripts which are still extant, even if Leonardo had made no later additions to these, are sufficient to stamp him as an anatomist far in advance of his time, as one who, for himself, cast aside the traditional anatomy of the day and pursued the methods of modern anatomy; and this, fifty or sixty years before the final establishment of anatomy upon the basis of actual observation, which resulted from the publication of Vesalius' *Fabrica* in 1543. In the fifteenth century, anatomy was bound fast by Galenic tradition; indeed, it was worse than this, for the accepted authorities were Latin translations of the Arabian commentaries of Galen. For so low had the study of the classics fallen that there were few who could read the original text of Galen. Mondino, it is true, had written a small work of forty-four pages as early as 1315 and had made actual dissections, being the first since the Ptolemaic anatomists to dissect a human body. For the most part, however, his work was based upon the statements of the Arabists, Hyrtl stating that much of it was copied verbally from the Latin translation of the Canon of Avicenna. The book was nevertheless for two hundred years the standard in the medical schools; it was first printed in 1498, and successive editions appeared until 1550, in which year a commentary upon it was published in Pavia by Matteo Corti. Indeed, it was even prescribed by law as well as by custom as *the* text-book of anatomy. Thus, in Leonardo's time, the books on anatomy were translations of translations of Galen, and so corrupt had the text become that Marc Antonio della Torre, professor of anatomy at Pavia in the early part of the sixteenth century, felt obliged to

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petition for and obtained permission to substitute Galen in the original for Mondino in his teaching.

Leonardo certainly studied the works on anatomy in favor in his day, references to Mondino and Avicenna occuring in his manuscripts, and a reference to Galen has also been noted. But he refused to be bound by mediæval traditions, as were his contemporaries, but worked out his own anatomy by personal observation. Compared with the anatomy of his contemporaries it was as light to darkness. The man who at the beginning of the sixteenth century could draw up such a plan for anatomical investigation as that which has been quoted, could not fail to stand pre-eminent in the history of anatomy, even although his plan was only partially carried out.

Not only in his method of acquiring knowledge was Leonardo far in advance of his times; he also far excelled his contemporaries in the art of presenting his knowledge. For he was the first to recognize the value of systematic illustrations in anatomical description. Not that manuscript anatomical illustrations were unknown, for in Leonardo's time illustrations were used (8) in the works of de Ketham (*Fasciculus medicinae*, 1491), Pegligk (*Philosophiæ naturalis compendium*, 1499), Hundt (*Antropologium*, 1501), and Frisius (*Spiegel der Artzny*, 1515). But these figures were few in number; they were rather for illustration than for instruction, and were far from true to nature. It was not until after Leonardo's death that Berengario da Carpi (1521) systematically employed anatomical illustrations, but these were largely diagrammatic and rough in execution, far different from the artistic drawings of Leonardo, and frequently incorrect. Leonardo, as has been seen, planned to represent every part of the body; he fully appreciated the advantage possessed by good drawings over verbal descriptions, and no such combination of artistic ability and zeal in observation has ever been devoted to the service of anatomy.

Many of his figures are preserved in the Royal Library at Windsor, having in some way, probably through the Earl Arundel, Ambassador to the Court of Ferdinand II, Emperor of the Holy Roman Empire, came into the possession of Charles II. They were forgotten after his death, until discovered by Dalton, who served as Librarian to George III. He called the attention of William Hunter to their existence and Hunter wrote concerning them: "I saw, indeed, with astonishment that Leonardo had been a general and a deep student. * * * I believe Leonardo was

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by far the very best anatomist and physiologist of his time." A better knowledge of Leonardo's achievement only confirms these words of Hunter; indeed, it was not until the middle of the sixteenth century that any anatomical work was produced that could stand comparison with that of Leonardo.

Before passing on to a consideration of Jackschath's charge, a few words may be said concerning the relations between Leonardo da Vinci and Marc Antonio della Torre. It is generally accepted, mainly on the authority of Vasari, that della Torre and Leonardo were collaborators in anatomy and that a joint work was in preparation, for which della Torre was to prepare the text while Leonardo was to supply the illustrations. Della Torre was born, probably in 1482, in Verona, and belonged to a family already eminent in medicine and law. At the age of eighteen he was called by the Grand Council of Venice to Padua, then under the control of Venice, as public instructor in medicine, and later became Professor of Theoretical Medicine. After a few years in Padua he was called to Pavia, then under the domination of Milan, as Professor of Anatomy. His transference to Pavia cannot have taken place earlier than 1506, for in that year he is recorded as having been still at Padua and six years later he died, before he had reached the age of thirty years (9).

Della Torre apparently wrote upon anatomy, but all traces of his work have vanished. He is supposed by some to have been the teacher of Leonardo and to have secured his services as illustrator for his "anatomy." But there appear to be difficulties in the way of such a belief. From Leonardo's own statement he was already interested in anatomical studies in 1489, while della Torre was a child of seven years of age, and it seems equally clear that Leonardo proposed to write as well as illustrate a treatise on anatomy. That the two were associated in anatomical studies during della Torre's residence at Pavia seems certain; probably they were attracted by a common interest, and the proposal for collaboration may have been made. But that it was seriously entertained by Leonardo seems doubtful in view of his definite statement about his own book and in view of the fact that throughout his manuscripts he never refers to della Torre (5).

To come now to Jackschath's indictment of Vesalius; we have Leonardo's statement that he proposed to write a book on anatomy, that book is apparently lost, in reality it is the *Fabrica* of Vesalius.

Jackschath's contention rests mainly upon the following con-

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siderations. *First,* Vesalius was too young a man (twenty-eight years old) in 1543 to have written such a work as the *Fabrica; second,* in Leonardo's drawings peculiar symbols are employed for designating the various parts and these symbols are also found in the *Fabrica; third,* the *Fabrica* shows evidence of having been written at least as early as 1500, since the anatomists of the 16th century do not seem to have been known to the author; *fourth,* the *Fabrica* presents occasional erroneous treatment of the muscles in close agreement with Galen, and in one place a muscle found only in the dog occurs in a plate although the description is correct in the text. Let us consider these various points briefly:

1. As to the argument regarding Vesalius' youth at the time of publication of the *Fabrica,* it must be remembered that Vesalius began his anatomical studies in Paris probably as early as 1533, that he became Professor of Surgery at Padua in 1537, when only twenty-two years of age, and that in 1540, he had already, as the result of his own observations, become convinced of the inadequacy of the teachings of Galen. Furthermore, let it be remembered that the Renaissance was the period of the awakening of individuality and the casting off of the trammels of mediæval authority, and that the tree of knowledge was laden with ripe fruit ready to the hand of him who had sufficient independence to reach for it. It was, therefore, a period characterized by many examples of brilliant learning. Leonardo himself, and Pico della Mirandola (monstrum sine vitio, Scaliger) in Italy, Melancthon, a professor of Greek at Wittenberg at the age of twenty-one, in Germany, and Erasmus, More and Bacon in England, all men of extensive learning, were all products of the time. Vesalius was not an exception; he was possessed of abundant individuality, and that and the age in which he lived made the great work possible. And, after all, is it probable that an artist, such as Leonardo was *par excellence,* could have written the *Fabrica,* which throughout is a medical work (3)?

2. As to the symbols, Forster (10) has subjected them to a careful examination and finds the argument is without foundation. Leonardo's symbols were simply roman letters written backward with the left hand, as all his notes were written. The strange symbols used by Vesalius are, as he tells us himself, characters in common use in printing offices which he had to use after exhausting the Latin and Greek alphabets and numerals. Thus he uses an asterisk, the contraction symbol for *et,* the contraction symbols for *ει', ró,* etc., symbols not uncommon in the

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texts of the day and unemployed by Leonardo. And if Vesalius really stole the figures, why should he retain some of Leonardo's symbols in making the woodcuts? Why are not all the symbols like Leonardo's (3)?

3. Vesalius does refer to the anatomists of the sixteenth century and in no eulogistic terms. He does not, it is true, mention them by name, but several are sufficiently characterized by allusions to be recognizable.

4. It is true that in one of his human figures Vesalius inserts the scalene muscle of a dog, but he states concisely in the text that it is so and that it was done to save repetition of figures.

Jackschath's contention accordingly seems to fail under closer scrutiny, but in another article (11) he brings forward a new example of Vesalius' supposed plagiarism. He finds that if the backgrounds of a number of Vesalius' figures be cut out they can be exactly pieced together to form a single landscape which Jackschath recognizes as a Titian. The implication is that not only did Vesalius appropriate the figures of Leonardo, but he likewise made use of a landscape by Titian to form a background for them. Roth has repeated Jackschath's experiment and practically confirms it, but is the resulting landscape a Titian? Jackschath has offered no evidence that such is the case and the similarity of Vesalius backgrounds to the work of Titian had long before given rise to a belief that the illustrations of the *Fabrica* were from the hand of that artist. Thus in a folio edition of certain of Vesalius' plates published in 1706 the title reads: "Andreæ Vesalii Bruxellensis—Zergliederung des Menschlichen Cörpers. Auf Mahlerey und Bildhauerkunst gericht. Die Figuren von Titian gezeichnet. Augsburg, gedruckt und verlegt durch Andreas Maschenbaur, 1706" (8).

Who the artist really was, who is responsible for the plates of the *Fabrica*, is uncertain. They have been ascribed both to Titian and to Christoforo Coroliano. The former, however, at the time of the publication of Vesalius' first figures in the *Tabulæ* (1538) was sixty-one years of age and had achieved his reputation as a master; and no work by Coriolano is known earlier than 1568, and he was still alive in 1600, so that it seems improbable that he should have coöperated even in the *Fabrica* (1543). There seems to be little question, however, that the *Tabulæ* were drawn by John Stephan von Calcar, whose name appears on the title page and whose assistance is acknowledged by Vesalius in the preface. That he also assisted in the preparation of the plates

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for the *Fabrica* is probable, since Vesalius, 1539, in speaking of his future works expressed the hope that he might be able to avail himself of Stephan's services. This artist was a pupil of Titian, a fact which would plausibly explain the similarity of the backgrounds to the work of that great artist.

It would seem then, that a case has hardly been made out against Vesalius either by von Töply or by Jackschath. Nor, on the face of it, does it seem likely that he could have stolen so extensively from Leonardo without discovery. Vasari, who was familiar with Leonardo's drawings, makes no mention of Vesalius in his life of Leonardo, published in 1550, seven years after the *Fabrica,* nor does Lomazzo, who boasts himself to be a follower of Leonardo and who states that he saw "at Francesco Melzi's the drawings done by Leonardo's own hand in which he explains the anatomy of the human figure," make any reference to a plagiarism in 1584.

Furthermore, we have the evidence of an eye-witness that Vesalius both wrote and made drawings for the *Fabrica,* in the words of Joh. Caius, an Englishman, who tells us that he lived in the same house with Vesalius in Padua "for eight months, during which time he wrote and drew his books *de fabrica humani corporis*" (3). And it does not seem likely that an unbiased critic could find either in the style or execution of Vesalius' figures or in the treatment of his subject, evidence which would awaken a suspicion of a theft. If he was a plagiarist, how can the virility and learning of his later works be explained? And the reputation, which he achieved as a diagnostician at the Court of Charles V., when he was body physician to the Emperor, surely indicates that he was a man of parts. That he was a diligent and thorough anatomist there can be no question; the evidences of both his skill and zeal are abundant, and if responsibility for the *Tabulæ* be admitted, there seems to be no great demand on one's credulity in believing in his responsibility for the *Fabica.*

We must, then, I believe, continue to regard the *Fabrica* as the product of Vesalius' genius. It is possible that he may have heard of Leonardo's drawings after his arrival in Italy; indeed, he may even have seen them. But this is mere conjecture, and it must be admitted that he was already a diligent and successful investigator of anatomy, and of some renown as such, before he came to Padua in 1537. He was a product of the time just as Leonardo was; it was the Renaissance, the time when men began to observe and think for themselves, to look to original sources

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for information and give free play to their individualities. The spirit which moved both Leonardo and Versalius guided also the less responsive minds of Berengario, and della Torre and later of Fallopius, and Colombo. It was the "Zeitgeist" that produced Leonardo and again Vesalius.

Must we then deprive Vesalius of the crown he has worn so long? Leonardo was the first to create a new anatomy, but he created it for himself alone; Vesalius demonstrated a new anatomy to the world. It was the publication of Vesalius' *Fabrica* that revolutionized anatomy, while Leonardo's drawings were lying unpublished, at first the cherished possessions of his favorite pupil Melzi, later in the Ambrosian Library in Milan, and still later forgotten in the Royal Library at Windsor. We must credit Leonardo as being the forerunner of the new anatomy, but Vesalius must be recognized as its founder.

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JOSEPH ROBY, THE ANATOMIST.*

By Eugene F. Cordell, M.D.,

Baltimore, Md.

THE remarkable and picturesque individual, whom I have selected to bring before you this evening, was born at Wiscasset, Maine, in 1807. Of his family and earlier life, I have no further knowledge than that he was graduated at Brown University, in 1828. He began the study of medicine at Boston, under Drs. Jackson and Channing and soon distinguished himself as an insatiable reader. "It was not easy," says Dr. Oliver Wendell Holmes, who was his medical fellow-student, his colleague at the Dartmouth School and his intimate friend and correspondent for many years—in a communication to the writer—"to find this silent youth books enough to supply his demands. Laborious, sagacious, exemplary, devoted to his profession, singularly accurate as an observer and shrewd as a judge of men, he came forward in the practice of medicine with the highest qualifications."

The medical degree—*Medicinae Doctor*—was conferred upon him by the Harvard Medical School in 1831, and he immediately settled for practice in the city of Boston. But he lacked the qualities necessary for success in the practice of medicine—a fact which he himself recognized perfectly well—and soon deserted it for the more congenial employment of teaching. His singular ability as a lecturer was at once recognized. He was clear, methodical, exact, conscientious, laborious, self-reliant and thought of nothing but his duties while the lecture season lasted.

Although anatomy was his favorite pursuit and he justly ranked among the leading teachers of it in America, his acquirements were not limited to it. He held the Chair of Anatomy and Surgery at Bowdoin College, Brunswick, Maine, from 1837 to 1843, of Theory and Practice of Medicine and either Materia Medica or Pathological Anatomy at Dartmouth College, New Hamsphire, from 1840 to 1849, and of Anatomy and Physiology at the University of Maryland, from 1842 to 1860. For several years during his stay in Baltimore, he also delivered part or the whole of the course on the Principles and Practice of Medicine.

*Read before the Historical Section of the College of Physicians of Philadelphia, November 29, 1905.

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The circumstances under which he came to Baltimore were these. A vacancy had occurred in the Chair of Anatomy by the death of Professor William N. Baker, in 1841. The duties were entrusted temporarily to Dr. Alexander C. Robinson, as lecturer, but in the spring of 1842 it became necessary to fill the position permanently. Professor Nathan R. Smith advocated the selection of Dr. Robinson, but his colleagues did not think that the latter possessed the necessary experience. In this dilemma, the name of Roby was offered with very high recommendations and Dr. George W. Miltenberger, then Demonstrator of Anatomy, was commissioned to proceed to Brunswick, to hear him lecture; whose report was so entirely favorable that in April, 1842, Roby was duly elected and installed in the Chair. He fully sustained and even added to the reputation which his predecessors—Cocke, Davidge, Godman, Pattison, Wells and Geddings—had conferred upon it and proved a most successful and popular lecturer. He was at the University daily from nine to three o'clock attending to his duties. According to the late Dr. Alan P. Smith, who was his prosector, he was exceedingly particular about the dissections, insisting that the linen around the cadaver should be perfectly clean and white, and noticing the least misplaced nick—nothing could escape his sharp eye. Dr. Smith describes him in his last years as taking a pill of opium before every lecture, about fifteen minutes after which his eye brightened up and he was thoroughly roused to the work before him. Gross, in his *Autobiography*, mentions as one of his peculiarities that while discoursing most eloquently to his class, he kept his eyes riveted upon the cadaver before him. The editor of the *Medical Summary* (December, 1880), who must have known him, speaks of his enthusiasm, the polish, beauty and floridness of his language and the quaint gracefulness of manner and enunciation that charmed and captivated his auditors.

He married the same year in which he came to Baltimore. On the death of Professor Nathaniel Potter, early in the following January, he was called upon to finish the course upon the practice of medicine and he also lectured upon the same branch during the next session, 1843-44. There was much enthusiasism over these lectures and also over his introductories, which were exceedingly popular in Baltimore and always attended by crowds of citizens. He also delivered lectures upon non-medical subjects.

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For several years after coming to Baltimore, Roby returned to the North early every Spring, in order to lecture at Dartmouth, the course there being held at that season of the year. During the last two years of his life, in consequence of pulmonary tuberculosis, he was unable to lecture and Professor N. R. Smith performed his duties for him, turning over to him, with that magnanimity which characterized him, the entire proceeds accruing from his chair. For some time he did not seem to realize his condition, but in March, 1860, finding himself incapacitated entirely for further work, he resigned and was made Professor Emeritus. Without associates, isolated almost from the world, he lingered about the scenes of his earlier labors, drawn by an irresistible fascination to his little room at the college—his "den" as he called it, until June 3, 1860, when he was carried off by a sudden hemorrhage of the lungs in his fifty-fourth year. According to his oft repeated wish, his body was taken to Boston, and there, in the presence of a very few friends and connections, committed to the spot which he had himself selected in Mount Auburn Cemetery. His tombstone bears only this inscription, without date: *"Joseph Roby. Requiescat in Pace."*

Professor Roby was of a slight, spare figure, with straight hair, a serious countenance and a face, the lower part of which is described as retreating or "sunken." He wore glasses and had a thin, weak voice, which yet his audiences had no difficulty in hearing. Holmes speaks of the striking effect imparted to his features by "exquisitely arched, sharply pencilled eyebrows, such as it would be hard to match on any living face among us." Professor Bartholow compared his face to that of Voltaire. He possessed a delicate, nervous temperament verging towards melancholy, and his circle of friends and acquaintances was very limited. "Few men were less known," says Holmes, who highly prized his friendship and maintained a continuous correspondence with him for more than twenty years. Indeed, it has been said that this author owed a large part of the "Autocrat" to the suggestions of Roby. He was shy by nature and solitary by habit. He was not afraid to speak the truth and expressed his convictions with great freedom. "He saw too keenly into the minds and hearts of others to be always as charitable as those whose good nature is in proportion to the defect of their vision. He was a man dangerous to any person of false pretentions who came in his way, making no claims for himself which could be disputed, and not very tolerant of such in others." He was

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scrupulously truthful, and in religion held views of the same stamp as those of Holmes. "No one," says Holmes, in concluding his sketch, "knew the strong and weak points of his character better than the writer of this notice, and he is not disposed to exaggerate his excellencies. They do not need it. He was not only a man of superior intellect, but a fast and faithful friend, always ready with counsel and aid, one who could be an intimate, yet with a tact and delicacy which prevented his intimacy from becoming oppressive; a rare nature, in a word, which a delicate organization unfitted, in a measure, for the complete and cheerful exercise of all its varied powers, but which leaves a precious memory in a few loving hearts."

His extreme sensitiveness was manifested in his aversion to having his picture taken, and in the disposition of his lectures, which he consigned to the flames, exacting a promise from Holmes for a similar disposition of his letters. Although not a season passed that he did not make numerous observations not recorded previously, he never published any scientific or literary papers. The only writings left by him in print, so far as I know, are the college catalogue and a report on Education made by him to the American Medical Association. The latter was not printed in the *Transactions* and I have not been able to find the journal containing it; I will refer to it again. The excellence of the former may be judged by the statement of the editor of the *Boston Medical and Surgical Journal* (Sept. 18, 1850), that it was of a character "that would establish a reputation for its author." I will only quote from it the following passage as an example of its contents and style: "Modern medicine differs from that which has preceded it mainly in this: that while it esteems at their full value the powers of art, it also regards and wisely regards the powers of Nature, teaching the true wisdom of watching patiently, observing carefully, acting cautiously: so that the operations of Nature being clearly understood, the ministrations of Art may be judiciously, effectively and beneficially applied."

Holmes thus spoke of Roby's letters to himself: "They are remarkable for the spirit with which they are written, for the sharpness of their estimate of persons and passing events, and for the unexpected depth of sentiment they reveal, the extraordinary tenderness of heart, so alien as it would have seemed, to his shy and outwardly cold nature. If this correspondence could be published, full as it is of personal revelations and confidences not

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adapted for the general eye, it would be enough to give him a literary reputation. As it is, he has lived without seeking fame, and died without leaving any public permanent record of himself."

Knowing this much about Professor Roby, it has always been to me a matter of the deepest regret that his writings should have been so lost to the world. It was therefore with the greatest interest and pleasure that I very recently learned of the existence of a number of his letters written during his annual summer visits to New England from 1849 to 1852, to his colleague, Professor Richard Henry Thomas, of Baltimore, the Professor of Obstetrics in the University and also a minister of the Society of Friends. Whilst doubtless falling far short of the variety, the abandon, and the carefulness of preparation of the Holmes epistles, they fully sustain the reputation that has been assigned to their author. There are twenty-one of them, and I shall devote the remainder of my paper to an examination of their contents:

Dr. Roby's vacations were spent chiefly in the vicinity of Boston, with midsummer trips to the seashore. His wife and two children accompanied him. "We are quietly settled in the country again," he writes in April, 1850, "with peace all around us, plenty of sunshine and quiet that would coax even so devoted a lover of sick faces as yourself from tongue inspecting and pulse counting." Again, in May, 1851: "Here we are in the country, which you know God made and man did not. I don't know how you feel toiling and moiling amongst the sin and sickness of city humanity, but as for myself, the peace and quiet of the country always brings me nearer to the great hereafter, which we must all encounter—the final solution of all problems." And still a little later: "We have been in the peach blossom, apple brewing, lilac glowing country for a fortnight or more, can see the peas born, asparagus grow, and corn covered and be more convinced—with as much intensity of conviction as Friend William would covet—that after all the origin of the country is divine, of the city devilish. Part of this, and the major part if you please, is habit, for I have no liking for strange faces and scenes." Here amid the singing of the birds he could think down hours to moments and gain fresh strength and inspiration; or prepare those hated introductories, those "giants Grim," as he calls them, which yet brought him such fame. At the seashore, on the other hand, he found pleasure in fishing, in listening to the roar of the waves or in splashing about in the water, "while Mary looks on or off."

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He was devoted to his children, whom he calls in one place his "pickaninies." "The babies thrive as well as their natural depravity permits: sometimes the good angel reigns, at other times the dark spirit: but good or bad, we feel that they are the anchors that keep us from floating into the sea of selfishness which swallows up those who have no cares but those which concern their own carcasses." In another place he writes: "Charge all the inky disfigurements of this missive to Hall and Min, whose fingers have been at work and whose rummagings of my letter book have left revealing traces." The illness of his son led to the following reflections: "I could not help thinking, as I watched him day and night (and he was very ill), how all the outside annoyances of life dwindle before the great events of one's own home. Who cares for the sharp words of fifty unknown assailants when the deep shadow of dangerous disease is falling upon his child? Ah, Doctor, the 'Lares' and 'Penates,' they are the divinities of my mythology; not the God of War or of Fame (Goddess, by the way), nor even the God of Medicine—but respectable old—I don't know his name: the God that is worshipped by children just out of the bathing tub, in night drawers and night caps—clean, clinging and kissable: beseeching for 'one more story'—'just one more' —or some other favor to them, as important as to us trifling."

We naturally expect to find mention of Holmes: "You remember Holmes: he has been coaxing me kindly all summer to visit him at his summer rest, and I have been promising all summer; but, alas, those Lions! how they stand in the way—affrighting us from a thousand better and more important objects than a summer's jaunt." And the following summer: "I am going up to see Holmes next week. He has a summer home in Berkshire—the border county of Massachusetts: so near to New York that people get their coats (and politics) cheaper there than here." Holmes offers "to dip his quill" for him—in the dispute about the report, "but the old proverb 'least said,' etc., seemed to satisfy him."

He was on most intimate terms with Bartlett and met him often. "Bartlett is as good," he writes, "as a derelict friend can be." He also met Horner, with whose family he was charmed, and knew Flint and Ware, whose approval in the controversy gave him much comfort. Ware gives him the philosophic caution: "I know of nothing for which one is so poorly paid as for defending himself." He refers to "Yankee professors" being

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called from Buffalo to Louisville with the comment: "So you see wooden nutmegs are still in demand." And when informed of the possibility of a visit from his correspondent, he expresses the pleasure it will give him, to show the "lions of Yankeedom."

He has no liking for the New England climate: "Do you know what climate this region of Puritanism and of all other 'isms,' for that matter, delights in? Steady north-east winds, cloudy skies and marrow chilling atmosphere. We have not had sunshine for a month, except for a day or so. For most of the acidity and acerbity, coldness and calculation of the Yankee, I think this bleak climate ought to be responsible. He cannot ripen; all the juice is acid and his very soul is pinched by the bitter starvation of this untempered breathing place. I think, Doctor, that even your elastic temperament would quail and flag under its influence." Again: "I hope that the austerity of these pinching winds is somewhat tempered before it reaches you, or if not that you have so much intrinsic capacity of endurance that they sweep harmlessly by. It has often occurred to me that the 'Pilgrim Fathers' must have been both innocent and ignorant when they coveted these shores; or else that they must have had an awfully hard time of it at home—or peradventure, more conscience and less consciousness than their degenerate descendants. For my own part, I do not know that I would not rather encounter the most disheartening form of caloric—such as old John Rogers did not wink at—than this piercing, heart-starving cold, which comes upon one like the concentrated essence of a thousand Nova Zemblas, and is only aggravated by the reminiscences with which all one's grumblings are met that there has not been a milder winter since the Pilgrims parched corn on the shores of Plymouth Bay." May 6, 1851, he writes: "One of those cold, cheerless comfortless days which pinched the Puritans of old so severely that they hung—better men and women than themselves—for conscience sake." * * * "The pinched Puritan, so full of East wind, conceit and consumption, bowing at one shrine and offering up the marrow of his bones in daily sacrifice, that he may win its reward—money."

Of another section at the opposite point of the compass, where his correspondent had just been visiting "the scatterings of Quakerdom," and its peculiar institution, he has this to say: "Old Virginia! what a Virginia she would be if she could only shed the snake skin and be regenerated by the introduction of some

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three or four hundred thousand Anglo-Saxons. I have never had much occasion to vex my head about serfdom of any kind, and fear that you would impugn my philanthropy were I to confess that I care more for dead than live ebonies, but I cannot help believing that a state so noble in all natural resources would be all the better were there nothing peculiar in her institutions, and nobody to cherish and cling to those peculiarities. Pity is it not, that she lacked a friend William to shape her destinies under the guidance of Him who fashions the Friends William for the Universe?"

The celebrated trial of Professor Webster for the murder of a colleague was then being held at Boston and was attracting the breathless attention of all sections of the country. Of the accused he writes, July 22d, 1850: "Webster's fate is fixed, and with the almost unanimous assent of the community. By his own admission he committed murder, robbery and (virtually) perjury; tried suicide, attempted to involve the innocent and deserves all that the law will inflict. Nobody pities *him;* everybody grieves for his family. I think I may safely say that the universal voice of the people here coincides fully with the stern sentence of the law. Yet, after all, 'tis a fearful thing to take life even with the countenance which law and justice give to the act and the awful formalities and deliberation which accompany it. No man ever had a fairer chance than Webster. And, spite of all the cavil and carping outside of Massachusetts, he had the best done for him that could be done by shrewd and sagacious men. From the outset, however, they felt there was no defence to be made, and they had the greatest difficulty in preventing him from making matters ten times worse by his duplicity and folly. There was literally no end to his falsehoods and the lie of to-day, however gross, was outdone by the lie of to-morrow. You can scarcely conceive of the utter contempt with which his whole conduct is regarded. And now: 'Abner dies as the fool dieth.'"

Here is an interesting case of puerperal infection: "We have been in a state of some anxiety about M's. brother, who got infected five weeks ago by a dispensary patient who was turned over to him after confinement. He saw her but two days and used the catheter four times. Two days after, he was attacked, had sudden severe chill, headache, pain in the back and other symptoms of acute constitutional disturbance. I saw him in an hour and feared small-pox, typhoid fever or other grave disease. By chance I asked him if he had any cuts or abrasions on his

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hands; whether he had had anything to do with autopsies or dissections. He told me of the case and pointed to the knuckle of his left index finger where I saw a small red spot, a little swollen. On recollection, he recalled having knocked off a bit of skin before he saw the woman and of getting his hand soiled with the vaginal discharge. I at once looked for the usual phenomena, but except a swollen and tender axillary gland found nothing, though he complained of much pain in the left pectoral region. By and by, red lines appeared and presently swelling extending over the clavicle. In a day or two the constitutional symptoms increased with constant delirium and in the end he has just escaped with a large abscess under the pectoralis muscle, extending to the axilla. He is excessively reduced, is as feeble as a baby and altogether has suffered greatly. The woman died in four days from delivery. A pretty fair case 'of inoculation."

Eighteen hundred and forty-nine was the cholera year and he comments upon its absence in Baltimore. "We have a good deal of it in this quarter and why you have none passeth my knowledge. For you, with the 30,000 denizens of niggerdom, are entitled to it, while the thrift and cosiness of Yankeeland should win exemption. People console themselves by saying that the chief mortality is among the P—— and Dutch; but spite of this a true descendant of Mayflower Puritanism dies now and then. * * * Dr. John Jackson, an exceedingly accurate observer, tells me that he has examined many cases and finds some difference between them and those he saw in 1832: less suffering, less profuse diarrhea, less rice water. They seem to be knocked down by the poison without much of the external (usual) manifestations. * * * The unfortunate mystery of such terrific inflictions rebukes all scientific pride into silence."

We get glimpses now and then into that inner life open to so few, where Holmes loved to roam and which he found so rich in that sort of material which his genius knew how to frame into gems of literature. "I wish that the occupation of professional practice were as attractive to me as to you, and that my faith in the efficacy of medicine and its ministrations were as strong as yours; and more than all that I had been the inheritor of your joyous temperament and genial disposition. But the truth is, so large a part of my life was passed in social isolation and what the transcendantalists would call introversion, that I touch the world through habit, at few points and should die under the exacting wear and tear of dosing the moral and physical ills of

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the sick." * * * "You cannot tell how afraid I am of strangers—the remnants of many years of diffidence and isolation. Nothing so bad (except vice) for a youngster as shyness. It has been a stumbling block in my path for a lifetime, is always tripping me up and often passes for something worse." Such a passage as this, if we accept it as sincere and it bears the stamp of sincerity, indicates a mind intensely religious. Writing of Professor William Power, who was breaking down from the same disease to which he himself succumbed a few years later, he says: "I could wish him long life and the joys which life under its happiest aspects can bring, but it would be a wish infinitely inferior to that which trusts and hopes that in the transition from the joys of earth he may have assurance that the exhaustless and enduring bliss of the all hail hereafter is awaiting him. We must all die, Doctor, and with the conviction of the inevitable event and the inevitable eternity, what a wonder it is that we worry for the bestowments of time and slight those of the never ending and never ended." The loss of Power was but one of many disappointments which the University had sustained and he expresses the hope that among his correspondent's cranial prominences "the mountain of adhesiveness kisses the sky, and that alongside of it hope ranges like Teneriffe." He promises to concur in any arrangement the Faculty may make with reference to Power's chair—that of Practice of Medicine—even to the delivery of half the course if it be thought proper, although it would be against his inclination and he fears against the interests of the School. It would increase his labor a good deal and though he often feels his shortcomings as it is, would make him more afraid that what he should do might be better and more worthily effected by some one else.

His views of religion and destiny were as we might expect—broad, tolerant, philosophic. "In the hereafter we shall know whether there be 'many mansions' 'for Jew and Gentile, bond and free' or only a small cabin here and there for those who think with me or you. Ah, Doctor, there is the rub. We don't all think alike or live alike or act alike, or see the truth from the same point of view." Referring again to Power he says: "Above all—better than health, wealth, fame or life, he has that surpassing peace and the prospect of that surpassing happiness which I am afraid few of us estimate and strive for as we ought to do. You may, but it saddens me sometimes to doubt that I do." "Ah, Doctor, what a happy thing it is that in the final

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adjustment, all the items of position and time, circumstance and opportunity will be taken into account; that at the final rendering of account for the 'deeds done in the body' there will be due allowance for physical infirmity, weakness and sin! Else what could you and I hope for, live for and die for? For you cannot believe that there is a home for the 'thee' and 'thou,' and none for the 'yes' and 'no'; and if you don't believe it how can I"?

He is constantly solicitous about his correspondent's health. "Recollect the blessed mean!" "Don't waste all of this life in drugging the doomed out of the world or drugging the doomed into it." "I will attend to anything left unfinished at my arrival and you can go dosing about as much as you like." "Fifty-three visits in one day imply more wear and tear of mind and body than I should care to undergo. I hope that you endure it at some rational expenditure of mental and physical force. I say 'rational' because I believe that some men virtually throw away their vitality almost without thought; forgetting indeed that there are those about them to whom their life and health are as valuable as they can be to the most exacting of their patients. The old adage says 'it is better to wear than to rust,' but its truth is relative." "See that you do not become a broken down dray-horse in ministering to the people about you. All things in moderation, Doctor, and especially in the day and night work of your profession. The lives of half the persons you see are worth less to those who surround your own hearthstone than yours; therefore, remember that the exactions of even voluntary devotion have their limits." "Any man who slaves at the wheel with physical incapacity and an infant at home not a month old for a warning—what does he deserve? Don't be a white bondman, Doctor! Let the recollection of home have all proper weight." "Remember, Doctor, in the hot summer that it is the last ounce that breaks the mule's back. Do not become a white slave. Talk of the horrors of the cotton field—there is not an ebony in all Texas that endures half the drudgery of some of the followers of 'Friend William' whose good name we so fondly cherish—spite of Scotch vituperation. Confess it—confess it. With as much hopefulness and kindliness as you, I might have worked in the harness as courageously and contentedly; but lacking them I shiver at the thought. You, however, were made for the work: hopefulness, kindliness, confidence, cheerfulness, patience, forbearance—all in right proportion—all contributing to make you just the 'good man' Mary says you are and which without any

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design or desire of diminishing your estimate of my 'truthfulness or sincerity' I most heartily believe. You may omit this passage, if you please until you feel in need of a little fillip to your self-esteem; then read it and be consoled." "I hope you are not going to coop your self up in town all summer. * * * Take it easy, Doctor; don't be a drayhorse, for it won't do." "'Fifty-six visits'! No sane man would attempt them. I should like to know, Doctor what you live for. Why don't you buy, if purchasable, a *quantum suff.* of *woorara* and gently inoculate yourself with a maximum dose at once instead of selling your life and death piecemeal? Why a man who has assumed the responsibilities of consanguinity and paternity should feel that he has a right to become a martyr, be it science or humanity which urges him I cannot comprehend. * * * In truth I doubt if you have any right to sell yourself by inches, and were I a member of your church (?) or meeting (?) I should certainly regard you as a fine subject for stringent discipline." "We rejoice that you have another anchor out in the shape of a girl baby. M. bids me add that Mrs. T. 'should be thankful for a husband with good sense enough to save her from suffering by the use of one of God's best gifts"?

Dr. Roby liked Baltimore and his work there. He looks forward with pleasurable anticipation to his return, he counts the weeks, he is eager to be at work again in his "den." He has as many and as strong affinities and attachments in Baltimore as anywhere, all his "Yankee adhesiveness having been worked out." "My happiest days are passed in the little room of the college, where there is a daily duty to be done and a consciousness of its performance to be enjoyed." He contemplates with pleasure the sincerity of the efforts put forth to provide adequate instruction in the college and the respectability of the means of instruction offered to the students. He is interested in the addition to the infirmary or college hospital, and wants to see the library and museum built up and more useful. During Professor Roby's connection with the college many important improvements were made and I have every reason to think chiefly through his influence and exertions. I may mention compulsory dissection and attendance upon the clinics, a course of lectures upon Pathology, practical instruction in histology and microscopy, the introduction of gas into the dissecting room, etc. All accounts agree that he was a most inspiring teacher and we can

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hardly see how he could have failed to elevate and perfect very greatly the standard and character of the instruction.

A considerable part of the correspondence is devoted to the Report on Medical Education, which as chairman of a committee he presented to the American Medical Association. It seems to have stirred up a regular hornet's nest but Roby had the satisfaction of knowing that it was approved by his friends, Holmes, Bartlett, Flint, Ware and others and he consoles himself for the criticism which he aroused by the reflection that his motives were pure and that he had stated only what he believed to be true. It was satisfactory neither to the professors nor to the professed. The low condition of medical education at that time is known to all who read. It is sufficient to say that there were no preliminary requirements as to education and of course no preliminary examinations. The final examinations were oral and were a mere farce. In many schools there was no provision for clinical teaching and neither that nor dissection were compulsory. There were no laboratories. Microscopy was not taught and in only one school in the entire country—the University of Pennsylvania—did the session last as long as six months? As I have stated elsewhere, it is my honest belief that a student might then and indeed for many years later have obtained the Doctor's degree without knowing how to read or write. Roby's voice and influence were given for better methods and a higher standard, but the country was not yet ripe for that marvelous advance in medical education which was reserved for the last decade of the century.

NOTE: In the Autocrat of the Breakfast Table there is this allusion to Dr. Roby by name: "The Professor has a friend, now living at a distance, who has been with him in many of his changes of place, and who follows him in imagination with tender interest wherever he goes—in that little court where he lived in gay loneliness so long * * * in all those summer or winter nests he was always at home and always welcome. This long articulated sigh of reminiscences * * * is for that friend of mine who looks into the waters of the Patapsco and sees beneath them the same visions which paint themselves for me in the green depths of the Charles." And in a footnote to this he explains: "'That friend of mine' was the late Joseph Roby once a fellow-teacher with me in the Medical School of Dartmouth College, afterwards Professor in the University of Maryland. He was a man of keen intellect and warm affections, but out of

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the range of his official duties seen of few and understood only by a very limited number of intimates. I used to refer to my wise friend so often, and he was so rarely visible, that some doubted if there was any such individual or if he were not of the impersonal nature of Sairy Gamp's Mrs. Harris. I remember Emerson was one of these smiling skeptics."

A BIOGRAPHY OF FRANÇOIS MAGENDIE.

(Continued.)

By Percy M. Dawson, M.D.,

Associate Professor of Physiology, Johns Hopkins University, Baltimore, Md.

MEDICAL PRACTICE.

"The Great Idol of Human Credulity."

We have seen that as a man of science the two most characteristic traits of Magendie were his skepticism and his devotion to the experimental method. These characteristics also found expression in his practice of the profession of medicine. "To the young practitioners vaunting the success of their prescriptions, he would reply with good natured sarcasm: 'It is evident that you have never tried the plan of doing nothing.' If the extreme simplicity of this kind of treatment called forth not unreasonable objections, 'Be assured,' he would add, 'that for the most part when disturbance manifests itself, we cannot discover the causes; we can at most only perceive the effects. Our only usefulness in the presence of nature, which in general tends to the normal condition, consists in not interrupting her; it is only now and then that we can aspire to be sufficiently skilful to aid her.' "[89]

"This disease," said he, in one of his lectures at the college, "is rather an indisposition than a true malady,[90] at least when not aggravated by treatment. For if the physician appears to give it importance, if he makes frequent visits to his patient, if he questions him gravely, advises bleeding and other energetic measures, it is possible that a simple indisposition may become a serious or even fatal illness: one has only too many examples of this. But if you content yourself with that which simple preservation indicates, if the patient being a little cold is warmed, if you have him drink some aromatic infusion, it is certain that the

[89] F: p. 39.

[90] Leçon sur le choléra-morbus, pp. 5-6. Magendie is here speaking of "cholérine."

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disease will then be a slight affection which will never entail a serious mishap." His bluntness and skepticism seem never to have interfered with his success in practice, for his reputation was such that many in their confidence in his integrity and skill were more than ready to overlook his eccentricities, one of which was, as has already been stated, his refusal to "bow before the great idol of human credulity." In this connection Flourens tells the following amusing anecdote.[91] "On a certain occasion, on leaving a little boy whose condition presented alarming symptoms, he said: 'Let him do just what he pleases; that is all I prescribe.' Usually sparing of his time and visits, he lavishes both in behalf of this child, but adds nothing to his medication. On the evening of the third day, all at once his brow clears, and taking the invalid by the ear, he exclaims: 'Little rogue, you have not allowed me a moment's rest'; and giving him a little slap, 'Get up now and run about.' The delighted father asks, 'What then was the matter with the child'? 'What was the matter? *Ma foi,* I don't know; neither I or the whole faculty, if they could be honest with you. But what is certain is that everything has returned to its normal state,' and with this he disappeared."

Naturally, the lovers of medical miracles were rudely shaken when he told them that their only malady was a craving for being gulled, and it is probable that no would-be invalid ever came twice to him to be consoled for imaginary ailments.

But Magendie always preferred hospital to private practice. There he seems to have been beloved, for the poor patients of the Salpêtrière[92] presented him with a memorial when, in 1830, he quitted that hospital for the Hôtel-Dieu.

Now it ought never to be supposed that Magendie's skepticism paralyzed all his therapeutic efforts. Magendie was, above everything else, an experimenter, and if he did not accept traditional methods of treatment, he followed the suggestions of the experiments which he had himself performed on animals. Of the many instances of the way in which Magendie turned his laboratory experience to practical use the following may be cited; not,

[91] F: pp. 39-40.

[92] Magendie received the appointment of Médécine Suppléant to the Salpêtrière, July 12, 1826 (Dubois, p. 180). La Salpêtrière has now the oldest hospital buildings in Paris. It is remarkable for the extent of its grounds and buildings, which cover some seventy-four acres. It was founded by Louis XIV. as a refuge for old women, and received its name from some saltpetre mines which had occupied the same site.

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however, because the results in these cases were most satisfactory, but because the account is perhaps the most dramatic.

In the article entitled "Experiments on Hydrophobia" (27), Magendie comments on the impotence of all known drugs in combating this terrible disease. He then vividly describes his method of dealing with a mad dog which he had been hastily summoned to see. It appears that Magendie had noticed that a depression, especially of the nervous system, always occurred in animals when water had been injected into the circulation. He therefore called to his aid several students on whose courage, address and coolness he could rely, seized the frenzied animal and injected sixty ounces of water at 40° C. into the jugular vein, from the peripheral end of which ten to twelve ounces of blood were simultaneously withdrawn. The animal at once became quiet and soon went to sleep. At the end of five hours, the dog showed some difficulty in respiration and in this state died, but, adds Magendie, doubtless with a feeling of satisfaction, "there was never any return of the rabies."

Not long afterwards Magendie was sent for by M. Caillard, resident physician at the Hôtel-Dieu, to come to a case of hydrophobia in its last stages (48). Magendie found the patient strait-jacketted and in a desperate plight. Seeing that death was imminent, he felt justified in resorting to heroic measures. He therefore had the man held firmly while he injected a considerable quantity of water into the vein of the forearm. The injection required one hour and forty minutes, the pulse fell from one hundred and eighty to eighty, the patient became calm and drank water, the strait-jacket was removed. The man now appeared quite normal and was without fever. On the eighth day the patient died, not of rabies, however, but of pyæmia. This case also was a source of satisfaction to Magendie, for he had cured the man of hydrophobia. As for the pyæmia, he was at a loss to account for its origin, which is not much to be wondered at, seeing that the nature of infections was at that time (1823) quite unknown.

Such was the physician who, in 1828, was proposed by his friends as a candidate for the vacant chair of medicine at the Collège de France. But his coldness and reserve antagonized the Minister, so that Récamier[93] received the appointment instead.

[93] Joseph Claude Anthelme Récamier (1774-1852), in 1801, was appointed physician to the Hôtel-Dieu, and succeeded Laennec as professor of medicine, in 1826. In 1831, after his resignation, he retired for a time to Switz-

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THE COLLÈGE DE FRANCE.

Nomination, 1830.

In 1830, Récamier, who at that time was Professor of Medicine at the Collège de France, refused to take the oath of allegience to the newly proclaimed[94] King, Louis-Philippe, and his Chair at the College consequently became vacant. "This Chair," said Claude Bernard,[95] referring to this period, though the words were spoken twenty-five years later, "cannot be compared with any other. It is not such a Chair as that in the Faculty of Medicine, for example, which remains limited to the same special branch of pathology in fixed relation to the other Chairs, which taken all together represent to the student the sum of our knowledge of the medical sciences. In the Collège de France it is abstract science only which should be kept in view and this Chair should comprise the sum of scientific medicine in its greatest universality and in the highest expression of its progress. But this collection which we call medicine is composed of a host of special sciences—anatomy, physiology, pathology, and so forth. All these sciences, which constitute medicine, have not been developed simultaneously, but, on the contrary, successively and incompletely. Now since it is impossible to embrace this whole collection at once, the Chair of the Collège de France has always represented progress, in medical science, in whatever branch it was most conspicuous at any time. As a result, the character of the course should vary in the different periods of the science, according as scientific progress is present in one branch of medicine rather than in another. This is what I wish to prove by casting a glance back over the list of professors who have succeeded each other in the Chair since its foundation in 1542. I shall take from it certain names at random: Vidus Vidius (1542); Sylvius, or, Du Bois[96] (1550); Riolan (1604); Guy-Patin (1654); Tournifort (1703); Astruc (1732); Ferrein (1742); Corvisart (1794); Laennec (1831) * * * I ask you what tradition or relation could be established between such different men as those who I have just

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erland. Returning to Paris, he became a practitioner of great reputation. He was an ardent vitalist.—A. Boullée. Article: "Récamier." *In*: Biographie Universelle (Michaud) Ancienne et Moderne. Paris. Vol. 25, p. 292.

[94]Louis-Philippe accepted the title of king August 9, 1830.

[95]B: p. 22.

[96]Jacobus Sylvius, or, Jacques Du Bois.

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enumerated? Their names alone show the successive modifications of the Chair in relation to the needs of the day and the progress of the science." "And now," asked Bernard, "which of the medical sciences is to-day the most active and shows the most rapid progress? It is obviously experimental physiology."

The opinion which Bernard expressed in 1855, seems to have been held by many in 1830. Uuquestionably Magendie, as the representative of the rising science of experimental physiology—a science which dominated the chair of medicine at the Collège for the next fifty years—was the proper successor of Récamier.

Already, in June and September, 1830, there had appeared in the *Gazette Médicale de Paris*[97] an article which doubtless expressed the opinion of some of those best competent to judge. After a severe but impartial criticism of Magendie's work and views, this article ends with a still sharper criticism of the Faculty of the Collège and with an expression of the hope that Magendie might succeed in obtaining the nomination. The concluding paragraph reads as follows: "The choice of men in the reorganization which is being prepared will be significant. * * * The Faculty is careless, the instruction is lacking in breadth. It is necessary to remedy these two defects and this can be done only by the judicious renovation of the personnel of the school. Each new name indicates the principle which presides over this regeneration. The name of Magendie gives a guarantee in this respect and this is why we speak it at this time. M. Magendie enjoys a name which is pretty well renowned in the world of savants, and a reputation for independence which we believe to be well merited; the school can only gain by joining him to itself, for it will acquire thereby consideration of those beyond its own circle and an element of independence within itself. With regard to the interests of science, we have no doubt that these will be sufficiently served by this appointment; for with M. Magendie there will enter into the school a new scientific spirit different from that which dominates there. He will bring there new doctrines which, though we are a long way from endorsing them, ought to have a voice. Teaching bodies, like all other bodies, become modified in spirit only very slowly; they willingly live under the domination of traditions; the principal characteristics of their doctrines are conservatism and exclusiveness. When one considers that at the time of the mighty invasion of the

[97] Vol. 1, pp. 223 and 326. June 12, and September 4, 1830.

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system of M. Broussais[98] the school could not be appreciably affected and opposed the invasion with an unshaken firmness, one wishes to see broken in some way that solidarity, that uniformity of ideas which has in it something of egotism and lethargy. The acquisition of men with fixed and inflexible opinions of their own will contribute to this happy change. We are indeed a long way off, we repeat it, from wishing too great success to the theories, be they general or special, of M. Magendie, and if their implantation in the school seems to us to be good, it is not so much because of their intrinsic value as because they are very different from those which long custom has rendered sacred there. The idea of M. Magendie will break up uniformity and stimulate activity." [99]

Magendie received the appointment and in the year 1830 took possession of the Chair of Medicine at the Collège. The opportunity had at last arrived for introducing into the forefront of medical teaching in Paris the ideas which had made him famous in physiology, and of establishing in medicine the experimental method. But Magendie's activity in this field was destined to receive a sudden, though only temporary, check.

Cholera in Paris, 1832.

In 1826, a cloud began to gather in the valley of the Ganges. It grew slowly and gradually spread westward. It arrived at Cabul in 1827, and in the next year reached the Persian capital, driving the Shah and his terror-stricken court in flight to the mountains. It was the second pandemic of Asiatic cholera[100] and now it crossed the frontier and swept down upon Europe.

[98] François Joseph Victor Broussais (1772-1838) was born at St. Malo, and came to Paris in 1799, where he obtained his degree in 1803. In 1805, he became an army surgeon, serving in Germany, Holland, Spain and Italy, and returning to Paris in 1814. His doctrine resembles that of John Brown. It points to excitation or irritation as the fundamental phenomenon of life, and to an over-irritation as the principal cause of disease. His lectures were attended by crowds of enthusiastic students. His "Examen de la doctrine médicale généralement adoptée" (1816) drew upon him the hatred of the whole medical faculty. By degrees his views were accepted, and, in 1831, he became professor of pathology in the Academy of Medicine.

[99] Elles briseraient l'uniformité et provoqueraient du mouvement."

[100] See: E. C. Wendt. A Treatise on Asiatic Cholera. *New York, 1885.* Page 16. Also: A. Hirsch. Handbook of Geographical and Historical Pathology. Transl. by Chas. Creighton. *London, 1883.* Vol. 1, page 397.

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Ohrenberg was smitten in 1829. For a while St. Petersburg was protected by a triple cordon of troops, but soon the pestilence crept in through the lines. Leaving death and riot in its wake, the cholera passed from St. Petersburg to Cronstadt, Hamburg, and thence to Sunderland.[101] Meanwhile, it had crossed the Polish frontiers, overridden the Prussian and Austrian armies posted to intercept it, and devastated Germany.

In 1832, Magendie came before the Academy. "I am a physician," he said,[102] "and that vocation calls me to the focus of evil. I am going to Sunderland, hoping that by studying the cholera in the place of its appearance I shall bring back from there some useful suggestions. Give me more authority by making me your delegate." Accompanied by Guillott,[103] he proceeded to the infected seaport. Thence, he was directed to the seat of the first outbreak among the fishing population scattered along the coast. Here he found collections of individuals dwelling in most miserable huts, exposed to dampness, filth, and vice; living, sleeping and eating between the dead and dying, with instincts so brutal as to preclude the hope of any helpful intervention. Dejected, he returned to Paris where to the often repeated question "What shall we do?" he could only answer sadly, "I do not clearly know."

How the disease reached Paris[104] is unknown, but there seem to have been unreported cases there before the great outbreak on March 24, 1832. By the first of April the mortality had risen to 500 a day, and before the end of three weeks 7,000 persons had perished. The Parisians at first met the cholera with the careless bravado which characterized them, but as the disease spread, this changed into a panic. Most of the Deputies and Ministers fled, but the Royal Family remained in Paris. King Louis-Philippe was only restrained from visiting the Hôtel-Dieu by the efforts of his councillors. The Duke of Orleans went in his stead, accompanied by the Minister Casimir-Périer. The latter was smitten by the disease and died.

"The rich," said Magendie,[105] "will not lack physicians," and

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[101] Sunderland, a seaport in Durhamshire, twelve miles southeast of Newcastle-on-Tyne.

[102] F: p. 47.

[103] Natallis Guillot subsequently became a member of the Faculty.

[104] *See* H. Martin. Histoire de France depuis 1789 jusqu'à nos Jours. 2 Ed. *Paris, 1879.* Vol. 5, pp. 23-24.

[105] F: p. 49.

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he turned his steps towards the Hôtel-Dieu. Physicians, Sisters of Charity, ladies of the wealthy and of the less opulent classes, all rivalled each other in their courage and activity in the homes and in the hospitals.

Among the most ignorant, mad rumors changed terror into fury. The cry went up that this was not an epidemic, but a conspiracy of which the poor were victims, and mobs surged through the streets howling, "Vengeance! Death to the doctors! Death to the poisoners!" M. Grisquet, the Prefect of Police, seemed powerless. He had issued an order forbidding the throwing into the streets of dirt, garbage and rubbish, but the people, led by the rag-pickers, rioted and erected barricades. Political parties accused each other of the poisoning, and persons were killed by the rabble in their frenzy.

At length the epidemic abated, having in the six months of its visitation carried off 18,402[106] persons out of a population of about 800,000 souls.[107] The rioting ceased. Paris became in outward appearance as of old. Magendie returned to his laboratory and his experiments, but not, however, until he had received the cross of the Legion of Honor. "I think it very well awarded," [108] he was heard to remark with his characteristic frankness.

Lectures, 1832-1852.

During the great epidemic of 1832, Magendie continued his lectures at the Collège, and then was given the classic series on the cholera (74). In these he found abundance of opportunity for decrying the unwholesome tendency of those who sought to explain the origin of the epidemic by speculative reasoning. "In confining ourselves,"[109] said he, "to scientific and experimental progress, one does not reach such results as these. After having discussed all the facts which the cholera has furnished us, it is possible that we may find it our duty to avow frankly that several questions of the greatest importance relative to the epidemic are still unsolved. If such be our conclusion, I shall not hesitate to acknowledge it; my mission to you is not to please, but to

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[106]P. Langlois. Article on "Cholera." *In*: La Grande Encyclopédie, Paris, xi, p. 212.

[107]E. H. Vollet (Article on "Paris," *ibidem*, xxv, p. 1068) states that the population of Paris in 1831 was 785,812; in 1836, 899,313 persons.

[108]F: p. 50.

[109]Leçons sur le Choléra-Morbus. Pages 4-5.

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enlighten, to show you the true path without which science can make no certain step."

This series of lectures was followed by another on the physical phenomena of life (79). Here he dealt first with the relations of the processes of life to certain physical properties of the tissues, porosity and imbibition or absorption, viscosity and the circulation of the blood, elasticity and the behavior of the arteries. Thence, he passed on to a discussion of the heart sounds in health and in disease. Animal hydraulics next occupied his attention and in this connection he demonstrated many phenomena of the circulation by means of Poiseuille's new instrument of precision, the mercury manometer. He estimated the changes in the venous and arterial pressure resulting from the injection of such liquids as warm water, cold water, weak alcohol, coffee and so forth, and also the effect of painful or agreeable sensations. All the changes in blood pressure thus obtained he attributed to alterations in the heart action. The effect of defibrination was then observed and the resulting extravasations of blood commented upon. The effect upon the blood of various drinks, drugs and gases was next treated, "topics which," he said, "throw much light upon some very important diseases," and finally the microscopical appearances of the blood corpuscles were carefully considered.

A third series of lectures was then begun, this time on the functions and diseases of the nervous system (82). These lectures, like those on the physical phenomena of life, were collected by Constantin James and subsequently published.

Throughout these courses of lectures, in the midst of an inexhaustible wealth of facts, one finds everywhere the two prevailing ideas of Magendie—the inseparability of medicine and physiology, and the all-importance of the experimental method. He was lavish in his experiments; instead of lecturing he often performed researches in the presence of his class. "He had a gift," says Flourens, "of seizing phenomena as they passed and as they were, so to speak, on the wing."

Still, as a teacher, Magendie was never popular. He followed no plan, and at the commencement of a lecture did not know whither his fancy might lead him. For those persons, therefore, whose object it was to study the principles of science, his lectures were not at all adapted; but for those anxious to find out how new discoveries are made, and wishing to become discoverers

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themselves, there could not be a better school than the courses given by him.

Relation of Magendie to His Students.

In his intercourse with his students the singular asperity of Magendie's character again showed itself. "When a young man full of the ardor of youth, came to consult Magendie regarding ideas, projects of work, on which he had based the fondest hopes, he always experienced at the hands of Magendie a complete disillusioning. These frank councils were often badly received. But Magendie thought them a useful test whereby later and more cruel deceptions might be avoided. If, on the other hand, one came to him with a fact, with the result of an experiment of which he wished to speak, Magendie's first reply was always a denial: 'All that that you are saying,' he would reply, 'is impossible, you are mistaken.' * * * But if one opposed him and, strong in the truth of what he was saying, wished to take him to see it, Magendie never refused to go; on the contrary he asked to go, and, if a good experiment were performed for him, which fully proved the statement which had been made, he was most happy to acknowledge it and to compliment the author who forthwith acquired his esteem and sympathy." [110]

"Theoretical discussions were always distasteful to him;[111] he desired nothing but facts, he wished only to see. 'I have eyes but no ears,' he used to say. When some one said to him, 'According to this law it should happen thus, or analogy indicates that the phenomenon will take place in such a way;' 'I know nothing about it,' he would reply, 'experiment and you will say what you have seen.' Experiment, such was the reply which he invariably made during forty years to all questions of this kind. The worship of experimentation was never carried so far; argument and induction were absolutely nothing to Magendie." This characteristic is seen again and again in his writings and also in the following anecdote told by Bernard, who for many years assisted him in his experiments.

"One of the great savants with whom Germany is honored, the celebrated Fr. Tiedemann,[112] came once upon a time on one

[110]B: pp. 28-29.

[111]This and the remaining quotations in this subsection are from Bernard.

[112]Friedrich Tiedemann (1781-1861), anatomist and physiologist, was born in Cassel, and was graduated in medicine at Marburg. He became a

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of his journeys to Paris to pay a visit to Magendie, who was then occupied with researches on the cerebro-spinal fluid (87). Magendie offered, as is the custom among savants, to show him his experiments and have him see the cerebro-spinal fluid oscillating below the visceral layer of the arachnoid. 'That is contrary,' replied Tiedemann, 'to the law of Bichat which we know regarding serous membranes. The liquids which are secreted by these membranes are never outside of them; they are enclosed in their cavities.' 'I have not concerned myself about that,' replied Magendie, 'whether or not it accords with the law of the physiology of the serous membranes, but I take it upon myself to show you upon a living animal that the cerebro-spinal fiuid lies under the visceral fold of the arachnoid.'"

"He esteemed experimenters more than philosophers. He distrusted those who held premature generalizations; he thought that these generalizations could be made very easily and, so to speak, quite of themselves, when the number of facts was sufficient. According to him the collecting of material was for the present the only occupation of the physiologist." "In our familiar conversations," writes Bernard, "he sometimes stated his opinion on this subject in a manner which was both picturesque and satirical. 'Everyone,' he used to say to me, 'compares himself to something in his sphere more or less grandiose, to Archimedes, to Michel Angelo, to Newton, to Galileo, to Descartes, and so forth. Louis XIV compared himself to the sun. With regard to myself, I am more humble; I campare myself to a ragpicker; with my hook in my hand and my basket on my back, I traverse the domain of science and gather up what I find.'"

Vivisection.

"Experimental physiologists," writes Bernard,[118] "ought not to forget a real service which Magendie rendered in habituating the public, so to speak, to the idea of the scientific necessity of experimentation on living animals. Such experiments used to be shut up and, as it were, *cachées* from the public in the depths of the schools. To-day one can advertise in the streets of Paris a course in vivisection given in a particular building." "In England," adds Bernard, "this prejudice still persists."

pupil of Cuvier in Paris. Later, in 1816, he became professor of anatomy and physiology at Heidelberg. He died at Munich.

[118]B: p. 14 *et seq.*

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Certain it is that the name of Magendie was hateful to the ears of the English antivivisectionists, who had denounced to Parliament, in 1820, "this stranger" [Magendie was then in London] "whose offensive temerity has broken through all the humanitarian barriers established by English zoöphilism.[114]

"Though as a vivisector," writes Bernard,[115] "M. Magendie has always put himself above prejudices, still he never braved them with ostentation, and he explained in his course how the science of the phenomena of life, necessarily based on a study of the living, demands vivisection, and how this kind of experiment, dominated and inspired by the spirit of science, no more deserves the reproach of cruelty than the vivisection of the surgeon dominated by the idea of saving the life of his patient."

"I am far from disawowing my experimental studies," [115] said Magendie, on one occasion to the assembled academicians, "but I beg my honorable colleague to observe that I experiment upon animals precisely because I do not wish to experiment on men." Again in the preface of the fifth edition of his "Formulary," he deprecates the fear "which has been and still is entertained by many, that the medicines might act altogether differently upon man and upon the other animals, * * *" "Nothing, however," he adds, "is more false than this idea; fifteen years' experience in my laboratory and at the bed-side of the sick, enables me to affirm that these medicines and poisons act in the same manner upon man as upon the other animals. My confidence in this respect is such, that I do not hesitate to use on myself the substances which I have found harmless in their effects upon other animals; and I should not advise any one to make the inverse experiment."

That Magendie did not treat with gruffness and discourtesy those who differed from him on the question of vivisection is expressly stated by Bernard, who also tells an anecdote to illustrate this point.

"I had then been," writes Bernard,[116] "M. Magendie's assistant for fifteen years and was helping him in an experiment, when we saw enter an elderly man, tall, dressed in black, wearing on his head a hat with a very broad brim, a coat with a narrow collar and short breeches. From this costume we readily perceived that we were in the presence of a Quaker. 'I wish,' said

[114]F: p. 25.
[115]C: February, 1847, xxiv, p. 142.
[116]B: p. 15.

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he, 'to speak with M. Magendie.' M. Magendie made himself known. The Quaker continued, 'I have heard thee talked of and I see that the report is true; for it is said that thou performest experiments on living animals. I come to see thee to demand of thee by what right thou actest thus and to tell thee that thou must desist from these experiments because thou hast not the right to cause animals to die or to make them suffer, and because thou settest in this way a bad example and also accustomest thyself to cruelty.' All the paraphernalia of the experiment were immediately put aside, and M. Magendie proceded to develop his argument in justification of the vivisectors. 'It is necessary,' he replied to the Quaker, 'to place yourself at another point of view in order to judge experiments on living animals. It is certain that if they did not have for their aim and their result the service of humanity, they might be taxed with cruelty. But the physiologist who is moved by the thought of making a discovery useful to medicine, and consequently to his fellow man, does not merit such a reproach. Your compatriot Harvey,' he added, 'would not have discovered the circulation of the blood had he not performed experiments on the deer in the park of King Charles I. Now who dares deny that this discovery has rendered the greatest service to humanity, and who dares accuse its author of having been cruel? War,' continued M. Magendie, 'would itself be a barbarous cruelty, if one does not consider its aim and its result for humanity. But what one can condemn is perhaps the chase, for then animals are caused to suffer and are killed merely for pleasure.' * * * 'Oh! certainly,' interrupted the Quaker, 'I condemn war and hunting just as much as I condemn experiments on living animals. In all these cases man gives himself rights which he has not got; that is what I wish to prove and I am traveling in order to cause to disappear from the world these three things, war, hunting and experiments on living animals.' Without doubt the Quaker was not convinced by M. Magendie, and no more was M. Magendie by the Quaker. But I wish to show that M. Magendie used to treat the subject with all the consideration which was due to it, and in this case, besides, to the worthy sentiments which had prompted the journey of the Quaker."

Certain it is that Magendie was one of the heroes of the pestilence, a kind physician at the Salpêtrière, a lover of animals who in the days of his prosperity spent all his spare time in his stables and in the days of his poverty shared his five sous a day

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with his dog. Hence, in the absence of conflicting evidence, it seems justifiable to conclude that he was neither unreasonably inconsiderate nor heartless in his treatment of the subjects of his study and experimentation.

(*To be concluded.*)

TRANSACTIONS OF THE HISTORICAL CLUB OF THE DEPARTMENT OF MEDICINE OF THE UNIVERSITY OF PENNSYLVANIA.

STATED MEETING, OCTOBER 20, 1905.

The meeting was held at the house of Dr. Roland G. Curtin, who presided.

A portrait of Dr. John Redman Coxe was presented, through the Club, to the Medical Department of the University of Pennsylvania.

The stated program of the evening, "Explorer's Night," was then taken up.

Attention was called to the large number of graduates from the Medical Department, who had become eminent as explorers.

Dr. Elisha Kent Kane (class of 1842) was in the Mexican War, visited the Philippine Islands, and was the first man to explore the crater of the great volcano Tael. He also visited and explored China, Ceylon and many other countries then unknown. He led the famous Arctic expedition in search of Sir John Franklin and his crew.

Mr. Bonsall, the sole living survivor of this expedition, gave some interesting reminiscences of Drs. Kane and Hays.

Dr. Isaac S. Hays was with Dr. Kane in the Arctic expedition, and commanded a subsequent expedition to the North, making anthropological and ethnological researches in the Arctic Highlands.

Dr. J. T. Rothrock (class of 1868) was associated with Lieut. George M. Wheeler in his expeditions, which led him into Northern British Columbia, Alaska, Colorado, Arizona, California and the West Indies.

Dr. F. V. Hayden was noted for his exploration of the Rocky Mountains in 1868. Drs. Peale and Turnbull were his assistants, the latter of whom was present at the meeting, and related some of his experiences.

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Dr. J. William White (class of 1871) contributed a letter describing his trip to South America, with Prof. Louis Agassiz.

Dr. H. M. Hiller sent an account of his scientific expedition, in 1895 and again in 1897 and 1901, to Japan, the East Indies, China, Malay Archipelago, etc.

Dr. A. Donaldson Smith had explored Somali Land; and many of the University graduates had been to the Arctic regions with Lieutenant Peary.

Dr. H. E. Wetherill described his experiences in the 1894 expedition of Peary.

After accounts of various other explorers and travelers, the meeting adjourned.

TRANSACTIONS OF THE ST. LOUIS MEDICAL HISTORY CLUB.

STATED MEETING, SEPTEMBER 27, 1906.

A meeting of the Club was held Thursday evening, September 27, 1906, at the St. Louis Medical Library. There were present Drs. J. Moores Ball, Baumgarten, Clopton, Grindon, Hardaway, Homan, Luedeking, Millican, Spencer, Steele, Thorpe, O. A. Wall, and Whelpley. Dr. Ball was elected to the Chair, and Dr. Homan Secretary *pro. tem.*

After reports of committees and informal two-minute talks by several members, Dr. Mortimer Frank, of Chicago, read a paper on "The Resurrectionists," dealing with the times and experiences of British anatomists, in the days before the dissection of human bodies was fully legalized. Numerous plates, portraits, books, etc., were shown in illustration of the paper.

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Vol. 4 December, 1906 No. 4

EDITORIAL.

A CYCLOPEDIA OF AMERICAN MEDICAL BIOGRAPHY.

WE desire to call attention to the letter of Dr. Howard A. Kelly, published on another page, in reference to an undertaking in which he is engaged, *i. e.*, the compilation of a comprensive and accurate cyclopedia of the biographies of those American physicians who have contributed to the advancement of American medicine and surgery. Especially to be commended is Dr. Kelly's avowed purpose of including in this cyclopedia "a brief sketch of the lives of men who have been very prominent in their own locality without, however, having been widely known as writers or original investigators. There are a number of men who have powerfully influenced the trend of medical and surgical thought who have never put a pen to paper to put their work before the profession."

In 1828 was published Dr. James Thacher's "American Medical Biography," a work in two volumes. As the pioneer in its

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field, from this storehouse of information concerning the early medical history of America as well as those physicians whose biographies it contains, later historical writers have drawn most liberally. Invaluable though this "Biography" has been, it is by no means free from inacuracies.

Seventeen years later, in 1845, Dr. Stephen W. Williams published his "American Medical Biography," a work avowedly designed to supplement Thacher's.

Next, in chronological sequence, of the larger works dealing with this subject is the "Lives of Eminent American Physicians and Surgeons of the Nineteenth Century," edited by Dr. Samuel D. Gross, and published in 1861. This volume contains thirty-two biographies, for the most part of individuals already dealt with in the two publications above mentioned.

Further contributions to this field are Dr. William B. Atkinson's "The Physicians and Surgeons of the United States," published in 1878 (second edition of which, entitled "A Biographical Dictionary of Contemporary American Physicians and Surgeons," was issued in 1880); Dr. R. French Stone's "Biography of Eminent Physicians and Surgeons," published in 1894 (second edition, 1898); and Dr. Irving A. Watson's "Physicians and Surgeons of America." From other than a commercial viewpoint these last three productions will not bear favorable comparison with their predecessors.

There is need for such a work as that in which Dr. Kelly is engaged in editing, and to make it of value to future medical historians and biographers there should accompany each biography a complete bibliography of the sources from which was drawn the material used in writing the sketch. This plan has been well carried out in Hirsch's "Biographisches Lexikon der hervorragenden Aerzte aller Zeiten und Völker (Wien u. Leipz., 1884-8, 6 vols., 8vo.), and greatly enhances the value of this monumental work.

We bespeak for Dr. Kelly the hearty support and co-operation of all the readers of the JOURNAL.

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CORRESPONDENCE.

BIOGRAPHICAL CYCLOPEDIA OF MEDICAL MEN.

BALTIMORE, NOVEMBER 28, 1906.

To the Editor:—I am at present engaged in a piece of work which must be a matter of profound interest to every practitioner in the country, and for this reason I turn to the JOURNAL to secure the co-operation of its readers.

I am preparing a Cyclopedia of American Medical Biography of the worthies who have passed away in this country and in Canada from the earliest times down to the present, including such living practitioners as have retired from active service.

The Cyclopedia will be issued in several volumes, the names being given in alphabetical order. I shall have the co-operation of some of the best men in the country, men who have already made a reputation as students of medical history.

I want in this work to give a full account of the lives, something of the personalities of the medical or surgical activities, and of the writings of all our leading men. I want also to include a brief sketch of the lives of men who have been very prominent in their own locality without, however, having been widely known as writers or original investigators. There are a number of men who have powerfully influenced the trend of medical and surgical thought who have never put a pen to paper to put their work before the profession.

In prosecuting this work, I shall have the aid of men who will take up the country by states, as well as those who will take up the various specialists. I want, in order to further my aim, to get hold of all the biographies that I can lay hands on which have been published in medical journals or elsewhere. I want also photographs, or photographs of pictures of these men.

It is for this reason I write to you, to ask the profession at large, to send me names, personal communications or biographies which they may have on their shelves and can spare, or medicals journals with references to biographies. I shall appreciate as a special favor any such communications.

The work will take two, perhaps three years, to complete. I will write later and give you the names of my collaborators, and ask for suggestions as to certain neighborhoods which may prove difficult to cover in this way. I will, also, at a still later date, publish a list of the names to be included in the biography, asking for further suggestions, that I may fill in all the gaps. The work is an ambitious one and is to be more elaborate than any which has yet appeared. I purpose to make the biographies anyhere from ten to fifteen lines up to as many pages; in the latter case using freely such biographies as Thacher's published in 1828. I shall be glad if any who are willing to help in this matter will write directly to me at 1418 Eutaw Place, Baltimore.

Yours very truly,

HOWARD A. KELLY.

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SEX AND CHARACTER. By Otto Weininger. Authorized Translation from the Sixth German Edition. *New York, G. P. Putnam's Sons,* 1906. xxii, 356 pp. 8vo.

The first appearance of this work in Germany, about three years ago, called forth a number of extravagant encomiums, as well as some sharp controversial retorts, and this English translation has already excited considerable attention.

It is certainly a very peculiar book. Many may find it interesting, but few, I venture to say, will pronounce it satisfactory. It "is an attempt," the author states, "to place the relations of sex in a new and decisive light —not to collect the greatest possible number of distinguishing characters [n] or to arrange into a system all the results of scientific measuring and experiment, but to refer to a single principle the whole contrast between man and woman. In this respect the book differs from all other works on the same subject. It does not linger over this or that detail, but presses on to its ultimate goal. It does not heap investigation on investigation, but combines the psychical differences between the sexes into a system; it deals not with women, but with woman." And in the next paragraph he tells us that "the investigation is not of details, but of principles; it does not despise the laboratory, although the help of the laboratory with regard to the deeper problems is limited as compared with the results of introspective analysis."

It is quite true that nowhere in the book is there weary lingering "over this or that detail," while it is everywhere obvious that the author was anxious, in the writing, to press on to his "ultimate goal." And it is evident that he had conceived and accepted his "single principle" before he had accumulated any considerable amount of relevant data; nor is there evidence of his desire to amass data, save such as might agree, or seem to agree, with his preconceived "single principle." His very view-point is, therefore, uninviting, if not indeed antagonistic to those of us who are seeking reliable knowledge, while his assertion that introspective analysis is of higher value for the solution of "the deeper problems" than are the tried and generally accepted methods of science and scientific philosophy, can scarcely be expected to receive the endorsement of the sane and serious.

In its avowed disregard of matter-of-fact detail the book is certainly defective, for the apprehension of principles without preliminary amassing, comparison and classification of more or less detailed data is an intellectual feat, affording spectacular amusement rather than gratifying results. The author's arguments, though apparently earnest, are far from convincing; probably because his methods are so different from those commonly employed in the gathering of sound knowledge. Many of his assertions are far too sweeping to admit of acceptance by the habitually critical, though to one who deliberately prefers neglect of detail, in order that he might, the more speedily, press on to a forechosen ultimate goal, by way of introspective analysis, they *may* seem quite self-evident.

In spite, however, of these and other defects, the book is, by no means, worthless. It deals with problems of absorbing interest, to some of which it offers solutions that are brilliantly suggestive, though unproven; it contains *some* matter-of-fact, almost hidden though it is in an erratic and mystical jumble. And as one passes from chapter to chapter of the medley, the question repeatedly and insistently presents itself: Can the author of this book have been mentally sound? Nor is the question an idle one, for from the book itself, and from what has been learned of the brief life of its author, a series of data might be gleaned which, taken as a whole, would quite distinctly indicate that during a part, at least, of the time occupied in its writing his was not *mens sana in corpore sano.* With the reviewer, who recently pronounced the book "a product of a precocious genius," I cannot, therefore, agree; but am inclined rather, to endorse the opinion of Probst, who, having examined what evidence he could collect,

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concluded that, from about the middle or latter part of 1901 until his death, by suicide, in October, 1903, Weininger suffered from a form of hysterical insanity characterized by alternate periods of almost maniacal excitement and melancholic depression, and that, inasmuch as the book was written during that interval, it should really be classed with the writings of the insane.

To epitomize adequately the book's contents would be no easy task, and will not, therefore, be attempted; but the following extracts and comments may give an inkling of its tendency and scope. The first or preparatory part deals with the biologico-psychological aspect of sexual phenomena and problems, while the second or principal part, as the author has termed it, deals with the psychologico-philosophic, and, in some degree, also with the sociologic aspects of the subject.

The author criticises the general habit of designating each individual animal—or even plant—as either "male" or "female," asserting that such gross division into two sexual classes is both inadequate and inaccurate, because it does not accord with the observed facts. Nor is there justification, he contends, in the inclusion of all intermediate forms in the one group termed "hermaphrodites." His arguments are these—and they are certainly worthy of careful consideration. There exists scarcely a so-called male who does not exhibit *some* obvious female characters, nor a so-called female who does not exhibit *some* male characters. There is a time during the embryonic development of every individual plant and animal when it is impossible to determine whether it will develop into a male or female, and even after it has attained full development, and is generally admitted to be, and spoken of as unisexual, because the characteristics of one sex have now far outstripped those of the other, it is, nevertheless, still bi-sexual, for it still contains, in rudimentary form, the characteristics of the opposite sex. In the case of adult human beings, for example, there has been found in individuals of each sex "a complete but rudimentary set of parallels to the organs of the other sex." Though most individuals develop in one or the other direction, "sexual differentiation is never complete." If all the relevant facts were carefully collected and properly interpreted, living individuauls instead of being grossly separated into males, females and hermaphrodites would each fall into its proper place in a series grading from the most markedly male on the one hand to the most distinctly female on the other. When thus arranged there would be—in the case of most animal species—a denser grouping toward the two ends of the series, and a third, less dense, intermediate grouping; but in no single instance would the designation *wholly* male, or *wholly* female, be applicable. There exist, therefore, numerous "transitional forms" while the wholly male and wholly female are but hypothetical or ideal, in much the same sense that the gas which behaves in strict accordance with the Boyle-Gay-Lussac Law is not an existent but an hypothetical, or ideal gas. On the basis of this conception a given human individual "A," ordinarily referred to as a male, would be more accurately designated by the formula $A = \begin{cases} \alpha\, M \\ \alpha^1 W \end{cases}$ in which M represents the ideal man, W the ideal woman and α, α^1 quantity or intensity. Similarly, a woman, "B," would be designated by such a formula as $B = \begin{cases} \beta\, W \\ \beta^1 M \end{cases}$

He claims not only that every living organism is bi-sexual, but also that every tissue and cell of a given individual organism is bi-sexual, and assumes for the idioplasm of every cell two modes which he names, respectively, arrhenoplasm (male idioplasm) and thelyplasm (female idioplasm). And he further asserts that "every cell, every cell-complex, and every organ" of a given individual has each, its own distinctive index, "on the scale between thelyplasm and arrhenoplasm," and that "for the exact definition of the sex [of a given individual], an estimation of the indices over the whole body would be necessary." "Arrhenoplasm and thelyplasm, in their countless modifications, are the microscopic agencies which, in cooperation with the internal secretions, give rise to the macroscopic differences" that constitute what are commonly known as sexual characters.

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The statistical knowledge thus far amassed concerning sex differences is of but little scientific value, he says, because investigators have taken for granted that every "John" is a representative male, and every "Mary" a representative female. "Until the exact degree of maleness, or femaleness, of all the living individuals of the group on which he is working can be determined, the investigator will have reason to distrust both his methods and his hypotheses," for "without the conception of an ideal male and an ideal female he lacks a standard, according to which, to estimate his real cases, and he gropes forward to a superficial and doubtful conclusion." He suggests, also, that "the study of comparative pathology of the sexual types is as necessary as their morphology, physiology and development."

His recognition of "the fact"—as he now calls it—that maleness and femaleness "are distributed in the living world in every possible proportion" led him, he says, "to the discovery of an unknown natural law, of a law not yet suspected by any philosopher, a law of sexual attraction," which he states as follows: "For true sexual union it is necessary that there come together a complete male (M) and a complete female (F), even though in different cases M and F are distributed between the two individuals in different proportions." Or, it may be expressed as follows: Let μ represent any individual ordinarily regarded as a male, and $M\mu + F\mu$ denote his "real sexual constitution." Let ω represent any individual ordinarily regarded as a female, and $F\omega + M\omega$ denote her "real sexual constitution." Then, in a case of complete and true sexual union between these two it is obvious that: $M\mu + M\omega = M$ and $F\mu + F\omega = F$. Or, in plain words, that though each individual is a mixture of maleness and femaleness, the relative proportions are such that by sexual union both a complete ideal male and a complete ideal female are realized.

He claims to have "worked out the law" in "many hundred cases" and that the exceptions to it "were only apparent." And though he admits that his exposition of the law "is somewhat dogmatical and lacks confirmation by exact detail," this mere lack of evidence seems to have given him but little, if any concern, for he says, "I am not so anxious to claim finished results as to incite others to the study," and "even if much remains theoretical, I hope that I shall have firmly riveted the chief beams in my edifice of theory by showing how it explains much that hitherto has found no explanation, and so shall have, in a fashion, proved it retrospectively by showing how much it would explain if it were true." Yes, *if* it were true. How considerate to try to cast the burden upon others—upon anyone, in fact, but himself. This is a sample of his manner and method. Not satisfied with the statement of a "law" expressing maximal sexual affinity, he attempts to express, mathematically, "the strength of sexual affinity in any conceivable case"—with what result "those who run may read," on pages 37 and 38 (and the remainder of the chapter, if they have the patience).

"Homo-sexuality cannot be regarded," he says, "as an atavism, or as due to arrested embryonic development, or incomplete differentiation of sex," but is merely the sexual condition of some of the intermediate forms between the ideal M and F.

In chapter V he expresses the hope that we may some day be able to state the sexual formula of every individual, and suggests the utilization of such formulæ in practical pedagogy; criticising the present system, according to which all children must line up either as males or females. He suggests, also, that a well-grounded science—not, as at present, a pseudo-science—of physiognomy would form a solid basis for scientific pedagogy.

In spite, however, of the non-existence of absolute males and females, in the sexual relations of any two individuals one plays the part of the male and the other that of female; and this is true even of homosexual couples, because one is relatively more male than the other

Between men and women, generally, there is one broad sexual distinction: man is but partly and periodically sexual, being at times psychologically outside his sexual self, he is conscious of it. Woman, on the other hand, is wholly and continuously sexual; therefore she is unconscious of her sexuality. For cognition implies duality—the cognizant and the cognized.

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What is commonly known as psychology deals with the mental life of man. Of female mental life we know very little, nor can we hope for enlightment from the female mind. The psychology of the female mind will have to be worked out by men who possess sufficient femaleness to appreciate it and sufficient maleness to develop it.

For the designation of certain early states of indefinite consciousness, in which perception and feeling are as yet undifferientiated and some of which later develop, through a clarification process, into well-defined mental states, he proposes the word "henid." The mental data of infancy are largely henids, he says, and woman "thinks more or less in henids," for in her case "thinking and feeling are identical," while man "thinks in more or less clear and detailed presentations in which the elements are distinct from the tones of feeling." A little further on he says: "The male lives consciously; the female lives unconsciously," for she has no super-sexual self-consciousness. And at the end of the following chapter—having meanwhile discussed the psychology of genius—he sums up the matter thus: "Woman, in short, has an unconscious life, man a conscious life, and the genius the most conscious life," p. 113. "As woman has no continuous memory she can have no *principium rationis sufficientis*" (*p.* 148), he says, and hence she is incapable of logical reasoning; may, in fact, be regarded as "logically insane," p. 149, while man "feels himself bound to logic," p. 149,. And, inasmuch as logic is the kernel of ethics, woman, because she is non-logical is non-ethical. She is not *im*moral, but merely *non*-moral.

"There is no female genius, and there never has been one * * * *and there never can be one.* A female genius is a contradiction in terms, for genius is simply intensified, perfectly developed, universally conscious maleness," p. 189. Besides, he asserts that woman has no soul, and "how, then, could a soulless being possess genius?" p. 189. Then he goes on to say that the "man of genius possesses, like everything else, the complete female in himself," p. 189. "Woman is not a monad," * * * "there is no 'I' in woman," p. 287. "Woman is the great emissary of pairing." "Women have no existence and no essence; they are not; they are nothing. Woman has no share in the ontological reality, no relation to the thing-in-itself, which, in the deepest interpretation, is the absolute, is God. * * * "she is neither moral nor anti-moral; mathematically speaking, she has no sign; she is purposeless; neither good nor bad, neither angel nor devil, never egotistical (and, therefore, has often been said to be altruistic), she is as non-moral as she is non-logical. But all existence is moral and logical existence. So woman has no existence," p. 286.

"Woman is nothing; therefore, and only therefore, she can become everything, whilst man can only remain what he is," p. 294. "Woman is first created by man's will—he dominates her and changes her whole being (hypnotism)"—295. "Man is form, woman is matter * * * Matter needs to be formed." Hence man creates woman. And what of man? Man alone is microcosm; he "contains woman," creates woman, makes of woman what he will. He is all that woman is, and all that she is not. Or, to state the matter briefly, by means of a commonplace expression, man is IT.

But why go on? There are pages and pages of this sort of folderol. Nor have I chosen the worst of it for quotation here. Comment upon such jibberish is quite unnecessary.

Naturally, he has much to say relative to the emancipation of women, by which term he means "neither her mastery at home, nor her subjection of her husband," nor "the courage which enables her to go freely by night or by day unaccompanied in public places, or the disregard of social rules which prohibit bachelor women from receiving visits from men, or discussing or listening to discussions of sexual matters," nor "the desire for economic independence," nor "the attainment of eligibility for higher teaching positions," nor "the wish for an outward equality with men" in any form, but "the deep-seated craving to acquire man's character, to attain his mental and moral freedom, to reach his real interests and his creative power." And he maintains that "the real female element has neither the desire nor the capacity for emancipation in this sense."

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His conclusion is summed in the assertion that "a woman's demand for emancipation and her qualification for it are in direct proportion to the amount of maleness in her," p. 64, and "The greatest, the one enemy of the emancipation of women is woman herself." p. 75.

Read the book; read it through carefully—twice, if you have the patience. And if you still believe the author to have been sane during the time he was occupied in the writing of the "Second or Principal Part," read "Der Fall Otto Weininger," by Dr. Ferdinand Probst (Weisbaden, 1904), and "Geschlecht und Unbescheidenheit," by Dr. P. J. Möbius (Halle, 1907).

Psychopathologists will profit by a careful perusal of the book; and in the hands of physicians in general it is safe. But the wide advertisement that has been given it, both here and abroad, may work harm. There are among us some who may be quite carried away—more or less fascinated by it. For evidence of this consult the advertising brochure of the fourth German edition (Wilhelm Braunmüller, Wien N. Leipzig, 1905).

J. C. CARDWELL.

NOTES AND NEWS.

With the issue for January, 1907, the *Journal of the Association of Military Surgeons* will change its title to *The Military Surgeon,* retaining the old name as a subsidiary title. We take pleasure, on this occasion, to congratulate its accomplished editor, Major James Evelyn Pilcher, on the highly successful career of this publication during the past six years of its existence. As the pioneer military medical journal in the English language, it entered upon a field hitherto unoccupied, and its success in creating a reliable body of military medical literature has been most marked.

NEW JOURNALS.

Ellingwood's Therapeutist. Finley Ellingwood, M.D., Editor and Publisher. Monthly. Vol. I, No. 1, January, 1907. Chicago, 100 State Street. Yearly, $1.00.

Therapeutic Medicine, a new independent journal, strictly under professional control and devoted exclusively to therapeutics, will make its appearance with the new year. Dr. William J. Robinson is the editor. Published by the Therapeutic Medicine Association, 12 Mt. Morris Park West, New York City. The subscriptions price will be $1.50 per annum.

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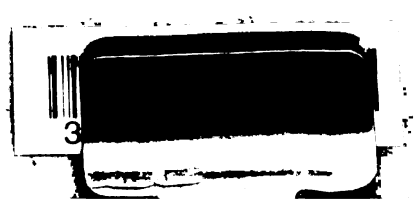

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